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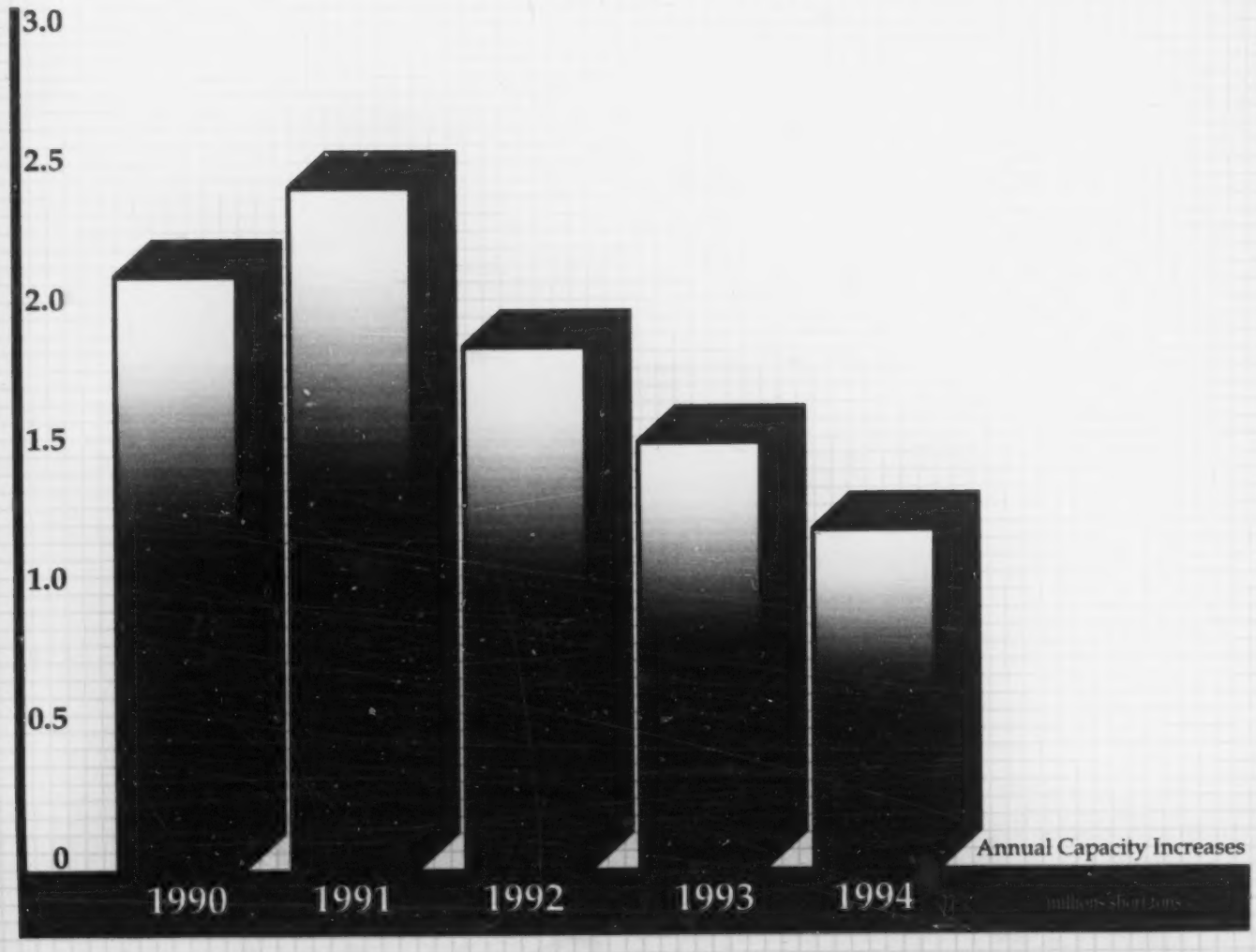
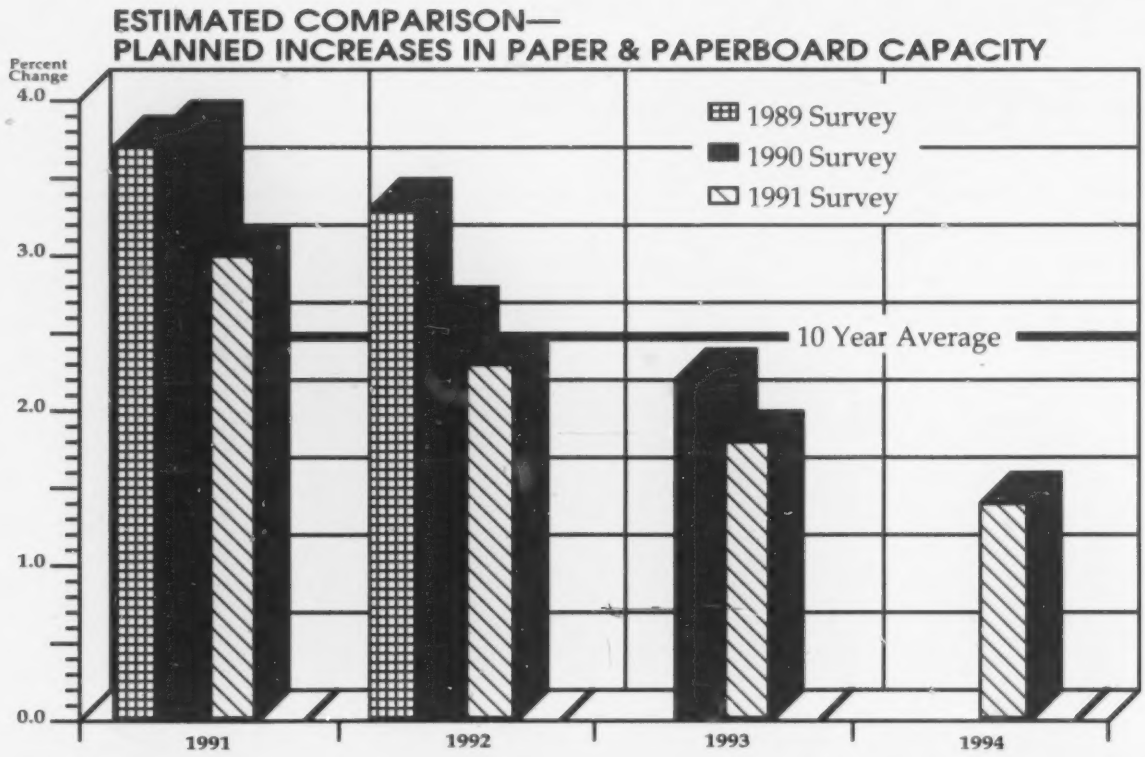
AMERICAN PAPER INSTITUTE • 32nd ANNUAL SURVEY

PAPER
PAPERBOARD
WOOD PULP
CAPACITY

AND FIBER CONSUMPTION

1990-1994





Producer's plans to increase manufacturing capacity for primary paper and paperboard have been lowered in two consecutive surveys. This graph depicts estimated increases in capacity reported in API capacity surveys published in December 1989, 1990 and 1991. (See Overview, page 3).

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The American Paper Institute has conducted annual capacity surveys in the primary pulp and paper industry for more than thirty years. Over time, the scope of the surveys has expanded significantly and now includes responses from producers of more than 90% of total U.S. paper, paperboard and wood pulp.

The outline below is intended to clarify definitions and methodology and to assist the user in utilizing the capacity and raw materials data in the survey report.

- Capacity projects included in the survey are firm commitments. Such projects will usually be approved by senior management or boards of directors, have assured financing and, in many instances, will include site acquisition and signed contracts for machines or equipment.
- Published capacities for paper and paperboard represent potential for *primary finished production* before conversion into end products. Capacities for wood pulp are measured at a 10% moisture content. Consumption of pulp wood, waste paper and other fiber are "as received at mill."
- The definition of practical maximum capacity assumes normal operating conditions, full demand, adequate supplies of raw materials and available labor. The concept assumes that machines operate on an "all out" basis on their customary grade mix.
- Daily capacities are extrapolated to annual totals based on the maximum number of days each machine can operate in one year. Downtime, scheduled before the start of the year, other than due to lack of orders is excluded from capacity. Unscheduled downtime, is included.

(Maximum operating days reported on pages 12 through 17 of this survey represent weighted averages of all machines in the industry).

- Capacity changes include the effect of new machine installations, rebuilds, shutdowns, revised operating schedules, grade and basis weight changes or other modifications to existing facilities. Changes also include grade reallocations on "swing" machines which reflect intermediate or long-range market strategies and not short-term adjustments to market conditions which are often revised on a monthly basis.
- Capacities of "swing" or multiproduct machines are distributed on the basis of actual grade mix. For example, a swing machine in one year may be capable of producing 100,000 tons of unbleached kraft linerboard, if run exclusively on board, or 80,000 tons of unbleached kraft paper, if run exclusively on paper. If, in fact, the machine produces board for 75% of its operating year and paper for 25%, its capacity would be published as 75,000 tons of linerboard and 20,000 tons of paper. Planned changes in grade allocations (swings) in future years would be calculated in the same way.
- Capacities of dismantled or permanently inactive machines are removed from estimates immediately on shutdown. Capacities of other idle machines are removed after one year unless resumed operation is in prospect.
- Capacities of individual mills are directly related to verified levels of production.
- Edit procedures establish that types and quantities of fiber consumed in each mill are consistent with verified annual production.
- Inconsistencies in reported data are reconciled by direct contacts with company executives.
- Published capacities are grade totals summarized to regional and industry levels. Specific establishment data are not disclosed in the survey unless publicly announced by the respective companies.

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OVERVIEW

After a strong 3.0% increase in U.S. paper and paperboard capacity in 1991, resulting mostly from expansion projects approved and funded two or more years earlier, the rate of capacity growth over the next three years is expected to continue but at a slower pace. Pulp and paper companies, responding to a prolonged climate of economic uncertainty and pressured by rapidly escalating environmental spending requirements, now plan to reduce investments in new manufacturing facilities below levels reported last year. Net additions to primary paper and paperboard capacity in the three-year period 1992-1994 are reported at 4,920,000 annual tons, and industry capacity is estimated to increase at a rate averaging 1.9% annually to reach 91,880,000 tons in 1994. The graph on the inside front cover illustrates the reduced capacity expansion plans in recent API surveys.

Growth in capacity for wood pulp follows a pattern similar to paper and paperboard with higher initial growth followed by lower rates of expansion in future years. Strong back-to-back increases of 2.2% and 2.4% annually have occurred in 1991 and are reported for 1992, as previously committed projects are brought into operation. During the remaining two years in the survey, 1993 and 1994, the rate of new investment will be curtailed, and wood pulp capacity is now expected to increase at a rate averaging only 0.7% annually in those years.

While rates of increase planned for total wood pulp are reported at lower than historical levels, producers of market wood pulps report an upcoming period of relatively strong expansion. These pulps provide an essential source of fiber for U.S. and foreign paper companies whose mills are not integrated to wood pulp. Four new world-class mills, capable of producing 1,300,000 tons of bleached sulfate market pulp annually, are now in production or scheduled to start up between 1990 and 1992. Output from these mills, supplemented by other projects and by facilities made available by cutbacks in expansion for associated paper capacity, will yield 951,000 annual tons of new capacity by 1994. In that year, the industry potential to produce market wood pulp for domestic and foreign use should reach 11,140,000 tons.

Table 1, which includes growth patterns for each of the major grades of paper, paperboard and wood pulp, shows that the highest rates of increase in capacity are planned by producers of coated and uncoated free sheet papers, recycled containerboard and bleached sulfate wood pulps.

For the first time in several years, additions to paper and paperboard capacity from

Note: Unless stated otherwise, all references to paper and paperboard and wood pulp exclude construction grades.

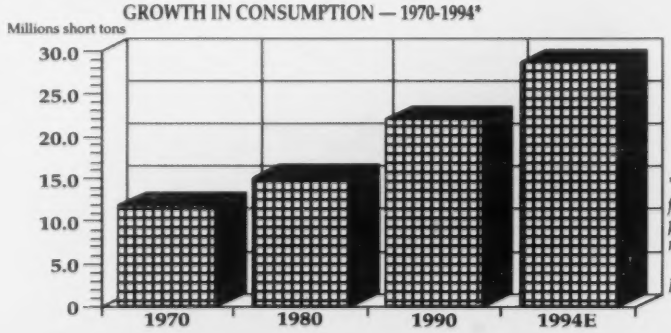
TABLE 1:
GROWTH TRENDS IN CAPACITY

Thousands short tons

GRADES	ADDITIONS 1992-1994		ADDITIONS 1981-1991	
	3 YEAR INCREASE	AVERAGE ANNUAL GROWTH	10 YEAR INCREASE	AVERAGE ANNUAL GROWTH
TOTAL ALL GRADES PAPER & PAPERBOARD	**4,923**	**1.8**	**16,801**	**2.1**
TOTAL PAPER & PAPERBOARD	**4,920**	**1.9**	**18,787**	**2.5**
TOTAL PAPER	**2,596**	**1.9**	**10,059**	**2.6**
NEWSPRINT	340	1.6	1,612	2.6
PRINTING & WRITING	1,864	2.4	7,817	3.8
of which Uncoated Groundwood	11	0.2	298	1.7
Coated Groundwood	121	0.9	1,379	3.8
Uncoated Free Sheet	1,091	2.7	4,153	3.9
Coated Free Sheet	585	4.6	1,786	6.0
PACKAGING & IND. CONV.	—	—	(576)	(1.0)
TISSUE	392	2.1	1,206	2.2
TOTAL PAPERBOARD	**2,324**	**1.8**	**8,728**	**2.3**
UNBLEACHED KRAFT	576	0.9	5,248	2.8
of which Kraft Linerboard	477	0.8	4,617	2.7
SOLID BLEACHED	467	3.1	745	1.7
SEMICHEMICAL	140	0.8	969	1.8
RECYCLED	1,141	3.5	1,766	1.9
of which Recycled Containerboard	1,086	9.5	1,061	4.7
CONSTRUCTION GRADES	**3**	**—**	**(1,986)**	**(6.4)**
TOTAL ALL GRADES WOOD PULP	**2,488**	**1.2**	**10,571**	**1.7**
TOTAL WOOD PULP FOR PAPER & BOARD	**2,488**	**1.2**	**11,905**	**2.0**
DISSOLVING & SPECIAL ALPHA	—	—	(105)	(0.7)
SULFITE	(46)	(0.9)	(158)	(0.9)
SULFATE*	2,633	1.7	10,632	2.3
Bleached	2,785	3.1	8,754	3.6
Unbleached	(152)	(0.2)	1,931	0.9
SEMICHEMICAL	(74)	(0.5)	(50)	(0.1)
MECHANICAL	(25)	(0.1)	1,586	2.6
CONSTRUCTION GRADES	**—**	**—**	**(1,334)**	**(11.0)**
TOTAL ALL GRADES MARKET WOOD PULP	**951**	**3.0**	**3,217**	**3.9**
CHEMICAL PAPER GRADES	934	3.5	3,314	4.9

** Includes screenings*

GROWTH IN CONSUMPTION — 1970-1994*



**Recovered paper as furnish for paper & paperboard manufacture.*

E=Estimate

TABLE 2:
NEW PAPER & PAPERBOARD CAPACITY 1992-1994

Thousands short tons

SOURCE OF CHANGE	3 YEAR INCREASE	
TOTAL INCREASE	4,920	100%
GREENFIELD MILLS	204	4.1
NEW MACHINES IN EXISTING MILLS	2,118	43.0
IMPROVEMENTS & REBUILDS	2,927	59.5
FACILITIES SHUT DOWN	(329)	(6.6)

rebuilds of machines, and from other improvements to manufacturing facilities that are already in operation, will exceed capacity additions from the installation of completely new paper machines. Table 2 shows that almost 60% of the gross increase in capacity reported for the three years 1992-1994 will result from miscellaneous improvements, while only 47% will be added from the installation of nine new paper machines. During the preceding three-year period, 1989-1991, twenty-eight new machines, with capacities totaling almost five million tons annually, were brought into production in both existing and greenfield mills.

Recovered Fiber Utilization

In contrast to lowered rates of growth in capacity for paper, paperboard and wood pulp, increased investment and expanded utilization of recycling facilities are reported in this survey. From a base of 22,009,000 tons of recovered paper consumed as raw material for papermaking in 1990, consumption is planned to increase more than twice as fast as for all other fibers and to reach 28,665,000 tons in 1994. At this level, recovered paper will comprise more than 30% of the industry's total consumption of fibrous raw materials, estimated at 93,714,000 tons in that year.

This expanded level of recycling, part of planned capital outlays that will total billions of dollars over the next three years, shows progress toward the industry's voluntary goal of recovering, for domestic use and for export, a full 40% of the nation's paper by 1995. An important aspect of the fiber consumption estimates reported in our capacity surveys is the extent to which these can serve as a surrogate for demand projections, based on a historically consistent relationship between future estimates and actual fiber consumption. For example, industry recycling plans will create a domestic demand for twenty-eight million tons of recovered paper in 1994 which, in turn, will require a major increase in municipal and private collection programs.

Table 4 shows that old corrugated containers and old newspapers will account for 72% of the expected 6,656,000 annual tonnage increase in recovered paper consumption between 1990 and 1994. Deinking grades and old newspapers, most of which must also be deinked before being processed into newsprint, will experience the highest rates of increase, averaging 8.0% and 9.7% annually. Utilization of total recovered paper should expand at a rate averaging 6.8% yearly.

Complementing the increased recycling rate in paper and paperboard mills, growing demand for paper products containing recycled materials has stimulated a corresponding increase in demand for deinked market pulp. This product, which is produced by removing inks and other contaminants from recovered paper, can provide a recycling alternative for paper mills with no on-site facilities to process and treat recovered paper.

Based on publicly announced projects, capacity for deinked market pulp is expected to expand rapidly from an estimated 325,000 annual tons in 1991 to approximately 1,000,000 annual tons in 1994. Beginning in 1992, API annual capacity surveys will include regular statistics on capacity to produce deinked market pulp as well as current and future plans to consume deinked pulp in the manufacture of paper and paperboard.

While the pulp and paper industry has significantly increased its utilization of recovered paper and further increases are expected, progress in now being impeded by the threat of mandated fiber content legislation. Like most other paper industries around the world, expansion of paper recycling investment in the United States has followed a recovery oriented approach, one which cannot be reconciled with mandated content requirements. These mandated fiber content proposals ignore the economic allocation of, and end-use requirements for, recovered paper, creating uncertainty over product specifications and over the future cost, availability and quality of raw materials. Realistic appraisals of these factors are essential elements in investment decisions in this most capital intensive basic industry in the U.S.

Regional Capacity

We have commented in previous surveys on the dominant position in the pulp and paper industry of the sixteen states that comprise the South East and South Central regions of the country. This dominance is again evident in this survey and, in 1990, mills located in these regions accounted for 53.3% of total paper and paperboard production and 68.3% of all wood pulp production in the U.S. For the first time in several years, these

TABLE 3:
ANNUAL CAPACITIES

Thousands short tons

YEAR	PAPER & PAPERBOARD			WOOD PULP		
	PERCENT INCREASE	CAPACITY ADDITIONS	ANNUAL CAPACITY	PERCENT INCREASE	CAPACITY ADDITIONS	ANNUAL CAPACITY
1970	—	—	53,260	—	—	43,505
1971	1.6	876	54,136	2.3	1,006	44,511
1972	3.2	1,737	55,873	2.3	1,029	45,540
1973	4.1	2,291	58,164	3.6	1,649	47,189
1974	2.3	1,363	59,527	0.9	448	47,637
1975	1.0	613	60,140	—	22	47,659
1976	1.9	1,167	61,307	2.3	1,100	48,759
1977	1.1	697	62,004	2.4	1,151	49,910
1978	1.8	1,087	63,091	(0.2)	(122)	49,788
1979	2.4	1,524	64,615	3.7	1,849	51,637
1980	2.7	1,753	66,368	3.1	1,578	53,215
1981	2.7	1,804	68,172	3.1	1,676	54,891
1982	2.8	1,914	70,086	2.2	1,234	56,125
1983	1.5	1,040	71,126	—	18	56,143
1984	2.8	1,972	73,098	2.8	1,599	57,742
1985	1.6	1,203	74,301	1.6	899	58,641
1986	2.0	1,476	75,777	1.9	1,109	59,750
1987	3.2	2,409	78,186	2.4	1,422	61,172
1988	3.0	2,347	80,533	2.9	1,778	62,950
1989	2.0	1,625	82,158	2.1	1,339	64,289
1990	2.7	2,235	84,393	1.7	1,078	65,367
1991E	3.0	2,567	86,960	2.2	1,429	66,796
1992E	2.3	2,006	88,966	2.4	1,575	68,371
1993E	1.8	1,638	90,604	0.5	329	68,700
1994E	1.4	1,276	91,880	0.9	584	69,284

E=estimate

TABLE 4:
PLANNED INCREASES IN RECOVERED PAPER CONSUMPTION 1990-1994

Thousands short tons

	TOTAL	MIXED PAPERS	NEWS-PAPERS	CORRU-GATED	PULP SUB-STITUTES	HIGH GRADE DEINKING
INCREASE IN ANNUAL CONSUMPTION	6,656	628	1,832	2,956	514	726
SHARE OF TOTAL INCREASE	100%	9.5%	27.5%	44.4%	7.7%	10.9%
AVERAGE ANNUAL GROWTH RATE	6.8%	5.8%	9.7%	6.3%	4.4%	8.0%

Southern regions will provide slightly less than a proportionate share of growth in paper and paperboard capacity, at 52.9% of total additions, in the four years 1991-1994. They will, however, account for almost all the planned additions in wood pulp capacity during these years, with new projects that will provide 89.6% of total expected increases.

Mills in the North Central region, with only an 18.2% share of capacity in-place in 1990, will provide an impressive 27.1% of all new paper and paperboard capacity in the 1991-1994 period. The three remaining regions are expected to contribute a smaller portion of new capacity additions during these years than their percentage share of the national total in 1990, both for paper and paperboard and for wood pulp.

Raw Materials

Consumption of wood pulp, recovered paper and other fibrous raw materials utilized as furnish for papermaking in 1990 totaled 82,588,000 tons. Of this amount, 44,765,000 tons, 54.2%, were derived from secondary materials. This proportion is expected to increase to 56.4% in 1994, mostly as a result of increased utilization of recovered paper, as the industry progresses toward its goal of increasing paper recovery to 40% by 1995.

Table 6 shows that consumption of recovered paper in 1990 reached 22,009,000 tons, or 26.7%, of total fibers consumed. Consumption of wood pulp derived of residues of manufacturing and forestry operations totaled 22,488,000 tons, or 27.2%, while the remaining 268,000 tons included cotton linters, bagasse, textile wastes and other miscellaneous fibers. Projections over the next four years show a rapid, 6.8%, average annual increase in consumption of recovered paper which is estimated to reach 28,665,000 tons, or 30.6% of total fiber consumed in 1994. Slower growth is estimated for wood pulp consumption, especially in pulps produced from secondary fibers, which will decline during this period from 27.2% to 25.4% of expected consumption.

Fiber estimates in this survey, for the years 1992 through 1994, were reported by producers using the assumption of capacity or near capacity levels of mill operation.

PAPER GRADES

Newsprint

The start up this year of a major new machine in the Pacific Northwest is contributing to a rapid rate of expansion in U.S. newsprint capacity. Between 1989 and 1991, five new machines were brought on-line and capacity has increased by 16%, or 954,000 tons, to reach an estimated level of 7,069,000 tons for this year as a whole. This cycle of expansion now appears to be interrupted and only 340,000 tons of new capacity, mostly residual gains from earlier expansions, are now reported for the three years 1992-1994.

The investment resources of the newsprint industry are now clearly focused on expanding the already sizable recycling capabilities now in operation. At least thirteen new deinking plants designed to remove inks from recovered paper are now in varying stages of construction or are under active study. Of these, committed projects included in this survey will increase recycling of old newspapers and magazines by an additional 1,041,000 annual tons by 1994; more than three times the expected increase in annual newsprint capacity.

In addition to installing deinking facilities in existing mills, companies are studying investments in five completely new recycled newsprint mills, which would recover a further 1,250,000 tons of paper annually from the solid waste stream. Although none of these projects is considered firm enough to include in this survey, the emergence of a coherent legislative environment at both the state and national levels of government could encourage the development of these and other tentative projects and help to move them from the planning to the implementation stage.

Despite recent growth in U.S. manufacturing capacity and market share gains, imports from Canada still account for more than 50% of domestic newsprint consumption. In their most recent report, the Canadian Pulp and Paper Association estimates capacity growth totaling 656,000 tons, or 5.7%, through 1994. On the basis of both the U.S. and Canadian surveys, North American newsprint capacity is expected to expand from 18,566,000 tons in 1991 to 19,561,000 tons in 1994.

Printing and Writing Papers

Paper industry capacity to produce uncoated and coated free sheet papers increased sharply in 1991, as six new machines, with capacities totaling 1,655,000 annual tons, began production during the last two years. These machines, one located in a greenfield mill, together with other improvements increased capacity this year for uncoated free sheet grades by 5.2% to a level of 12,981,000 annual tons and for coated free grades by 9.7% to 4,031,000 annual tons.

Over the next three years, capacity to produce bleached bristols, uncoated groundwood and coated groundwood grades are all estimated at lower annual levels than reported in last year's survey. Capacity for uncoated free sheet grades, however, with additional expansion projects planned, is now expected to exceed last year's estimate for 1993. In

TABLE 5:
REGIONAL CAPACITY DISTRIBUTION— PERCENT OF TOTAL

	PAPER & PAPERBOARD			WOOD PULP		
REGIONS	SHARE OF U.S. TOTAL 1980	1990	SHARE OF CAPACITY INCREASE 1991-1994	SHARE OF U.S. TOTAL 1980	1990	SHARE OF CAPACITY INCREASE 1991-1994
NORTHEAST	17.1	13.8	6.5	8.3	7.5	3.3
NORTH CENTRAL	17.7	18.2	27.1	7.1	7.5	(0.4)
SOUTHEAST	24.3	24.0	21.8	31.8	31.6	19.1
SOUTH CENTRAL	26.8	29.3	31.1	35.5	36.7	70.5
WEST	14.1	14.7	13.5	17.3	16.7	7.5

TABLE 6:
FIBER SOURCES FOR PAPER & PAPERBOARD MANUFACTURE

Thousands short tons

GRADES	1990 ANNUAL TONS	1990 PERCENT	1991 ANNUAL TONS	1992 ANNUAL TONS	1993 ANNUAL TONS	1994 ANNUAL TONS	1994 PERCENT	AVERAGE ANNUAL GROWTH 1990-1994
TOTAL CONSUMPTION	**82,588**	**100.0**	**85,656**	**90,138**	**91,923**	**93,714**	**100.0**	**3.2**
PRIMARY MATERIALS WOOD PULP FROM PRIMARY FIBERS	**37,823**	**45.8**	**38,713**	**40,383**	**40,261**	**40,906**	**43.6**	**2.0**
SECONDARY MATERIALS WOOD PULP FROM	**44,765**	**54.2**	**46,943**	**49,755**	**51,662**	**52,809**	**56.4**	**4.2**
SECONDARY FIBERS	22,488	27.2	22,871	23,346	23,484	23,825	25.4	1.5
RECOVERED PAPER*	22,009	26.7	23,808	26,109	27,860	28,665	30.6	6.8
OTHER	268	0.3	264	300	318	319	0.4	4.5

Note: Consumption for 1992-1994 assumes capacity levels of production
** Includes the following tonnage consumed in the manufacture of molded pulp products: 1990, 273,000 tons; 1991, 295,000 tons; 1992-1994, 312,000 tons.*

general terms, anticipated growth in capacity for total printing and writing papers will average 2.4% annually to reach a potential for 26,983,000 tons of production in 1994. Over the previous ten-year period, from 1981-1991, capacity for these papers had grown at an average annual rate of 3.8%, more than 50% faster than is presently contemplated for the next three years.

While capacity expansion for printing and writing papers will trail historical levels, use of recovered paper will increase by an exceptional 32% by 1994. Much of the increase will be in deinking grades with consumption reported to increase at a 14.7% average annual rate for the next three years.

Unbleached Kraft Packaging Papers

Vigorous and sustained competition from plastic packaging materials, including tee-shirt bags and other packaging products, has contributed to curtailed markets for unbleached kraft packaging papers. Further market pressure has been added by a rapid increase in imports, which have averaged 250,000 tons annually over the last three years. During a five-year period ending in 1989, producers of these papers were forced to shut down, reallocate or otherwise reduce capacity by 1,163,000 annual tons, or a full 29%. Over the same years, the paper and paperboard industry as a whole achieved production gains of almost 12%.

Continuing the downward trend, and despite additions to capacity from the start-up of a new paper machine and from facilities modified to produce recycled bag paper*, unbleached kraft paper capacity in 1990 declined by a further 100,000 annual tons to a level of 2,710,000 tons on an annualized basis. All of the reductions reflected machine swings from kraft paper to the production of kraft linerboard.

While expected growth in demand for recycled bag paper may result in some added capacity in future years, no major projects are now included in this survey, and capacity is estimated to decline slightly over the next three years to 2,633,000 annual tons in 1994.

Tissue

Growth in capacity for household and industrial grades of tissue papers has been relatively stable over the last ten years, with new production facilities expanding at a rate averaging 2.2% annually. A similar growth pattern is reported for the upcoming three years, 1992-1994, with expanded manufacturing plant scheduled to increase output at a rate averaging 2.1% yearly. This rate of growth will add 392,000 annual tons of capacity and bring the industry total to 6,633,000 annual tons in 1994.

The basis for this tissue expansion includes the start up of five new paper machines, which will provide 292,000 tons, or 75%, of the total increase. Three of these machines are designed to utilize recovered paper exclusively as the basic raw material for their products. As a result, annual consumption of recovered paper is estimated to increase by 453,000 annual tons by 1994, or more than twice as fast as expansion in tissue capacity.

**Capacity estimates for recycled bag paper are included in the unbleached kraft paper category.*

Thousands short tons

COMPARISON OF 1993 CAPACITY ESTIMATES— CONTAINERBOARD			
	1993 ESTIMATED CAPACITY		
PRODUCT GRADES	THIS YEAR	LAST YEAR	DIFFERENCE
Unbleached Kraft Linerboard	20,293	20,770	(477)
Recycled Linerboard	1,454	1,453	1
Solid bleached Linerboard	184	161	23
Semichemical Corrugating	6,069	6,072	(3)
Recycled Corrugating	2,263	2,402	(139)
Total Containerboard	**30,263**	**30,858**	**(595)**

PAPERBOARD GRADES

Containerboard

Estimates for containerboard capacity in this survey have been revised downward from year-earlier levels. The insert below, which compares estimates for the component grades of containerboard in our 1990 and 1991 surveys, shows that capacities now reported for 1993 have been reduced by 595,000 annual tons, mostly for unbleached kraft linerboard, but for the recycled corrugating grades as well. This is the second consecutive survey in which estimates of growth in containerboard capacity have been reported by producers at lower levels than previously planned.

Analysis of these lower growth rates shows a pattern of recession-influenced curtailments. Projects with longer lead times have been delayed or cancelled, while committed projects, with shorter lead times and less flexibility, have been stretched out or scaled-down. Reduced estimates account for approximately 250,000 tons of the shortfall. Similar retrenchments have occurred in previous recessions and have tended to be reversed in periods of economic strength and recovery. In addition to these curtailments, two major paper machines were shut down this year, and their capacities, totaling 350,000 annual tons of unbleached kraft linerboard and re-

cycled corrugating medium, have been removed from our survey estimates.

Taken as a whole, capacity for containerboard should reach 30,562,000 tons in 1994, and the rate of growth should average 1.7% per year over the three-year period. As with other product grades, use of recovered paper, which totaled 7,790,000 tons in 1991, will outpace growth in capacity. The rate of increase in consumption is reported to approximate 8% per year through 1994 and old corrugated containers will comprise 95% of the total.

Solid Bleached Paperboard

A one year delay, from 1992 until 1993, in the installation of a major new machine will contribute to a rate of increase in capacity for solid bleached paperboard below the 4.6% annual growth rate reported in our 1990 survey. From a base of 4,886,000 tons this year, capacity is now estimated to increase at a 3.1% average annual rate, and to reach a productive potential for 5,353,000 annual tons of bleached paperboard in 1994. While lower than last year's estimate, this rate of increase in capacity exceeds the historical 1.7% annual average rate and appears to be scaled to producers' appraisals of the pace of future growth in demand for food packaging products.

Recycled Paperboard (other than containerboard)

More than 70% of all recycled paperboard has end-uses other than in containerboard and is converted into folding cartons, rigid paper boxes, tubes, cans, drums and other packaging and nonpackaging products.

Capacity to produce these noncontainerboard grades totals 7,465,000 annual tons this year and is reported to increase, at a rate averaging 1% per year, to 7,695,000 annual tons in 1994. Consumption of recovered paper, which provides virtually all of the raw material for these products, shows a corresponding increase from 7,495,000 tons in 1991 to an estimated 8,042,000 tons in 1994, assuming the industry then operates at full capacity.

WOOD PULP GRADES

Dissolving and Special Alpha Pulps

No growth in capacity for dissolving and special alpha grades of wood pulp is planned during this survey period. Current estimates, at 1,493,000 annual tons through 1994, are 34,000 tons lower than reported in our survey last year. All of this reduction in capacity results from swings to the manufacture of paper grade wood pulps.

Historically, capacity for these pulps has shown little change. Fluctuations from year-to-year have been attributable to operational adjustments, grade swings and other responses to changes in market conditions.

Sulfite Pulps

Other than a 50,000 ton reduction in annual capacity in 1993 from the shutdown of a Midwestern pulp mill, capacity for sulfite pulp will remain unchanged during the three-year period, 1992-1994. This gradual decline in capacity continues a pattern in which older uneconomic plants have been retired and have not been replaced or have been superseded by another pulping process. Capacity for sulfite pulps, which stood at 2,000,000 tons annually in 1979, has declined to 1,697,000 tons this year and is expected to fall to 1,651,000 annual tons in 1994. During this period of decline, the number of sulfite pulp mills in operation will have decreased from twenty-six establishments in 1979 to seventeen now scheduled to be operating in 1994.

Bleached Sulfate Pulps

Capacity growth for bleached sulfate pulps, with major end-uses in printing and writing papers, food packaging and market pulp is expected to be relatively strong. Annual capacity is now estimated to increase at a 3.1% average rate, from 29,070,000 tons in 1991 to 31,855,000 tons in 1994. This rate of increase is higher than that of any other grade of wood pulp and, in part, reflects the robust expansion in market pulp capacity discussed elsewhere in this commentary. While the rate of capacity increase for bleached sulfate grades is higher than those reported for other wood pulps, it does follow the industry trend and is markedly lower than the 3.6% annual average rate of increase for these grades in the 1981-1991 period.

Unbleached Sulfate and Semichemical Pulps

Changes in patterns of raw materials consumption within the containerboard industry are affecting capacity plans for two major grades of wood pulp. Producers now report that capacity to produce unbleached sulfate pulps and semichemical pulps will be reduced by 152,000 annual tons and 74,000 annual tons, respectively, over the next three years. Capacity reductions in both grades will involve the shutdown of pulp mills, which will be replaced by plants designed to reprocess recovered paper as a substitute raw material in containerboard manufacture.

While outright reductions in capacity, rather than fluctuations in rates of increase, are an unusual circumstance, unbleached sulfate and semichemical pulps will continue to constitute the largest raw material source for the containerboard industry. In 1994, their share of total wood pulp capacity will stand at 39% as compared to 42% in 1990.

Market Pulps

The bleached hardwood and softwood sulfate grades comprise more than 80% of all wood pulp produced in U.S. mills for sale in domestic and overseas markets. In the ten-year period ending in 1991, capacity for these high quality pulps has increased by 68% or 3,331,000 tons, while market pulp capacity as a whole increased by 46%. Continuing high rates of capacity growth, averaging 3.6% annually, are reported over the next three years. Additions should total 917,000 annual tons and, in 1994, capacity for bleached sulfate pulps should reach 9,115,000 annual tons and account for 82% of total domestic market wood pulp production.

Capacity for sulfite, unbleached sulfate and dissolving market pulps should increase only marginally through 1994, and no initiation of newer chemimechanical (CMP) or chemithermomechanical (CTMP) market pulps is reported during the survey period.

SUMMARY

Over the next three years, expansion plans reported in this survey will provide the industry with new manufacturing facilities capable of producing 4.9 million tons of primary paper and paperboard and 2.5 million tons of new wood pulp annually. These additions will yield below-trend rates of growth in capacity. They represent planning adjustments reflecting weaker economic conditions and, to a lesser extent, a counterbalance to higher than usual capacity increases in 1990 and 1991. Similar reduced levels of growth in capacity have occured in earlier periods of economic decline or slowdown and have generally worked to prevent the development of fundamental imbalances between available capacity and demand for industry products.

This survey also projects new investments in recycling facilities and greatly expanded utilization of recovered paper as raw material in the manufacture of paper and paperboard. Based on already installed or approved recycling operations, the use of recovered paper should increase by almost 5 million annual tons from 1991 to 1994 and should constitute more than 30% of the industry's raw materials supply. These planned expansions continue a recycling effort in which the recovery rate for paper, from 1985 to the end of 1991, has grown five times faster than the rate of paper consumption.

capacity summary annual

Practical Maximum Basis
Thousands short tons

GRADES	1990	1991	1992	1993	1994*
Total All Grades	**86,514**	**89,056**	**91,062**	**92,703**	**93,979**
TOTAL PAPER & PAPERBOARD	**84,393**	**86,960**	**88,966**	**90,604**	**91,880**
Total Paper	**42,315**	**43,766**	**44,981**	**45,696**	**46,362**
NEWSPRINT	6,792	7,069	7,288	7,380	7,409
PRINTING & WRITING	24,149	25,119	25,945	26,435	26,983
Uncoated Groundwood	1,946	1,923	1,930	1,933	1,934
Coated Groundwood	4,414	4,426	4,463	4,520	4,547
Coated Free Sheet	3,676	4,031	4,268	4,463	4,616
Uncoated Free Sheet	12,335	12,981	13,482	13,709	14,072
Cotton Fiber	202	204	205	205	205
Thin Papers	262	255	255	255	255
Solid Bleached Bristols	1,314	1,299	1,342	1,350	1,354
PACKAGING & IND. CONV.	5,369	5,337	5,358	5,345	5,337
Unbleached Kraft	2,710	2,703	2,690	2,653	2,633
Bleached Packaging & Ind. Conv.	489	484	485	488	493
Specialty Packaging	661	692	710	722	723
Special Industrial	1,509	1,458	1,473	1,482	1,488
TISSUE	6,005	6,241	6,390	6,536	6,633
Total Paperboard	**42,078**	**43,194**	**43,985**	**44,908**	**45,518**
UNBLEACHED KRAFT	21,438	21,986	22,353	22,369	22,562
of which Kraft Linerboard	19,743	19,989	20,309	20,293	20,466
SOLID BLEACHED	4,706	4,886	4,967	5,122	5,353
SEMICHEMICAL	5,894	5,957	6,025	6,069	6,097
RECYCLED	10,040	10,365	10,640	11,348	11,506
of which Containerboard	2,717	2,900	3,099	3,717	3,811
Construction Paper & Board	**2,121**	**2,096**	**2,096**	**2,099**	**2,099**

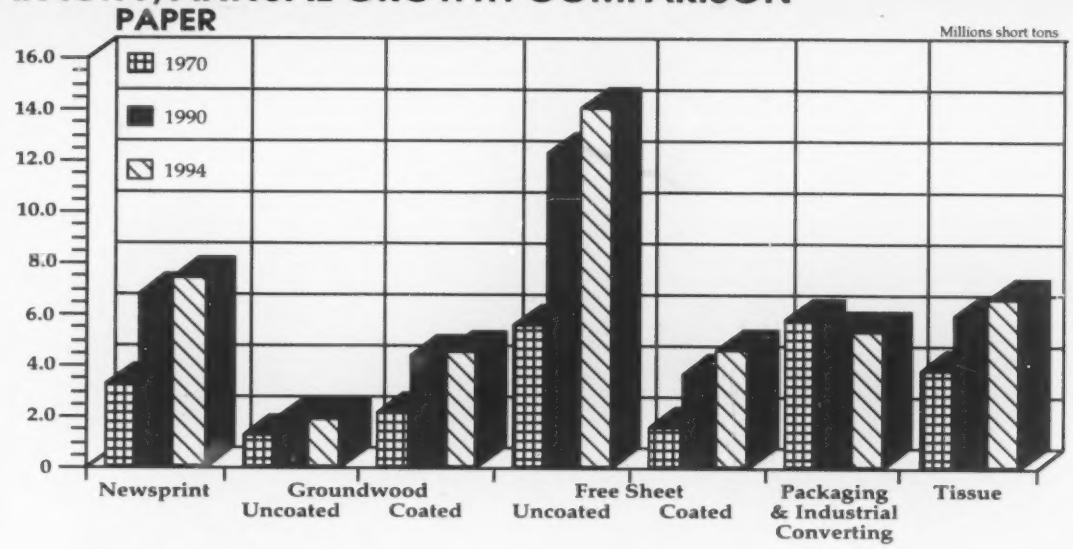
** Capacity additions presented here for 1994 include only presently known commitments and do not necessarily represent final expansion plans of the industry for that year.*

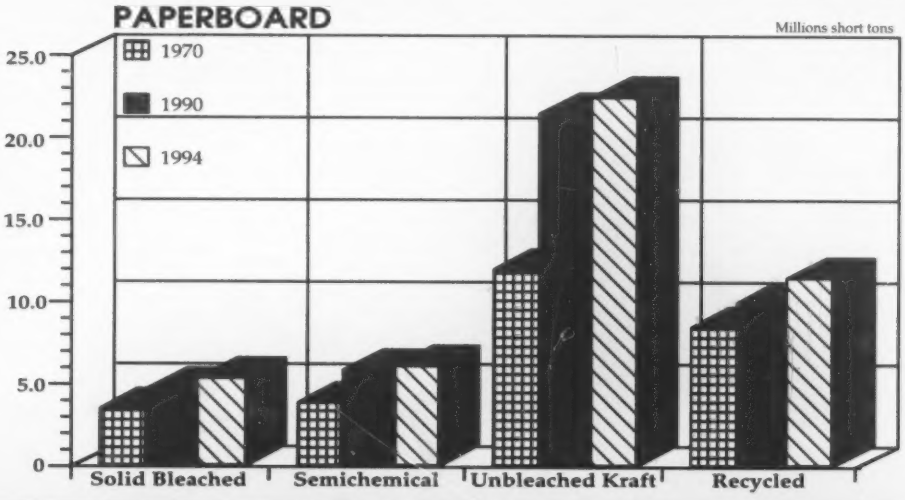
capacity reductions

PAPER & PAPERBOARD MILLS & MACHINES SHUT DOWN

GRADES	1971 - 1975 Number of Machines	1971 - 1975 Number of Complete Mills	1971 - 1975 Annual Capacity	1976 - 1980 Number of Machines	1976 - 1980 Number of Complete Mills	1976 - 1980 Annual Capacity
TOTAL	**135**	**39**	**2,482**	**163**	**53**	**3,990**
Paper						
Newsprint	—	—	—	3	1	231
Printing & Writing	51	8	803	32	5	550
Packaging & Ind. Conv.	35	8	290	32	7	395
Tissue	6	4	52	25	8	246
Paperboard						
Unbleached Kraft	2	—	128	2	1	400
Solid Bleached	1	—	33	2	1	162
Semichemical	3	1	123	4	1	178
Recycled	29	14	872	35	12	1,295
Construction Paper & Board	8	4	181	28	17	533

CAPACITY/ANNUAL GROWTH COMPARISON





Thousands short tons

GRADES	1981 - 1985* Number of Machines	1981 - 1985* Number of Complete Mills	1981 - 1985* Annual Capacity	1986 - 1994* Number of Machines	1986 - 1994* Number of Complete Mills	1986 - 1994* ANNUAL CAPACITY Removed from survey	1986 - 1994* ANNUAL CAPACITY Not Removed from survey
TOTAL	**222**	**88**	**6,228**	**95**	**23**	**3,699**	**35**
Paper							
Newsprint	5	—	360	—	—	—	—
Printing & Writing	38	4	771	36	6	720	—
Pkg. & Ind. Conv.	31	7	821	16	4	680	—
Tissue	30	13	308	19	5	169	35
Paperboard							
Unbleached Kraft	5	—	742	5	—	1,190	—
Solid Bleached	—	—	—	2	—	142	—
Semichemical	7	2	553	4	—	455	—
Recycled	18	12	644	7	3	218	—
Construction Paper & Board	88	50	2,029	6	5	125	—

Shutdowns represent machines and mills reported to the API as permanent or indefinite closures and have been removed from capacity totals. Not all of the facilities have been dismantled and some portion of their productive capacity could be restored.

** Includes machines converted to produce other grades.*

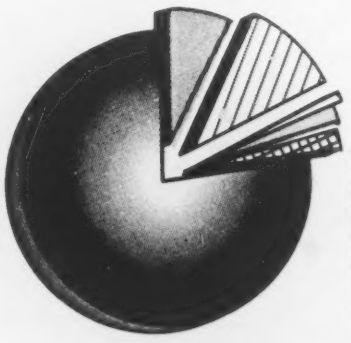
capacity summary annual

Practical Maximum Basis
Thousands short tons

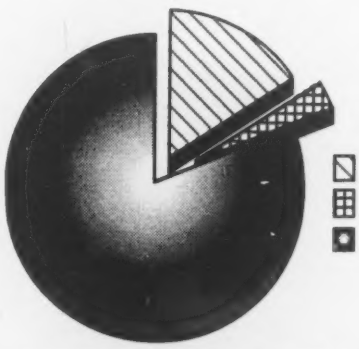
GRADES	1990	1991	1992	1993	1994*
Total All Grades Wood Pulp	**65,985**	**67,402**	**68,977**	**69,306**	**69,890**
TOTAL WOOD PULP FOR PAPER & BOARD	**65,367**	**66,796**	**68,371**	**68,700**	**69,284**
DISSOLVING	1,486	1,493	1,493	1,493	1,493
CHEMICAL PAPER GRADES	52,250	53,670	55,323	55,687	56,257
SULFITE PAPER GRADES	1,689	1,697	1,706	1,655	1,651
SULFATE PAPER GRADES	50,561	51,973	53,617	54,032	54,606
Bleached Softwood	14,412	15,023	15,636	15,960	16,250
Bleached Hardwood	13,407	14,047	14,919	15,319	15,605
Unbleached	22,742	22,903	23,062	22,753	22,751
SEMICHEMICAL	4,669	4,547	4,473	4,473	4,473
MECHANICAL	6,957	7,081	7,077	7,042	7,056
SCREENINGS	5	5	5	5	5
Wood Pulp for Construction Paper & Board†	**618**	**606**	**606**	**606**	**606**
TOTAL MACHINE DRIED WOOD PULP	**11,685**	**12,293**	**12,922**	**13,187**	**13,241**
DISSOLVING	1,499	1,500	1,507	1,509	1,517
CHEMICAL PAPER GRADES	10,025	10,632	11,254	11,517	11,563
SULFITE PAPER GRADES	428	445	445	450	450
SULFATE PAPER GRADES	9,597	10,187	10,809	11,067	11,113
Bleached Softwood	5,852	6,168	6,612	6,808	6,851
Bleached Hardwood	3,575	3,849	4,016	4,077	4,080
Unbleached	170	170	181	182	182
ALL OTHER	161	161	161	161	161

** Capacity additions presented here for 1994 include only presently known commitments and do not necessarily represent final expansion plans of the industry for that year.*

† Excludes the defibrated/exploded pulp capacity of mills that produce hard pressed board.

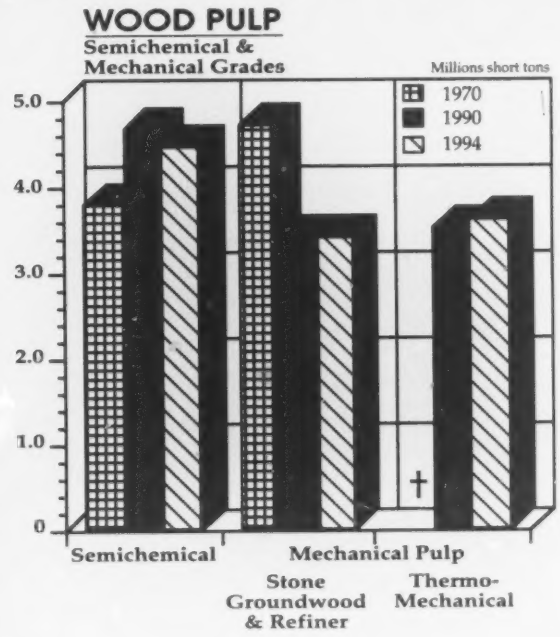


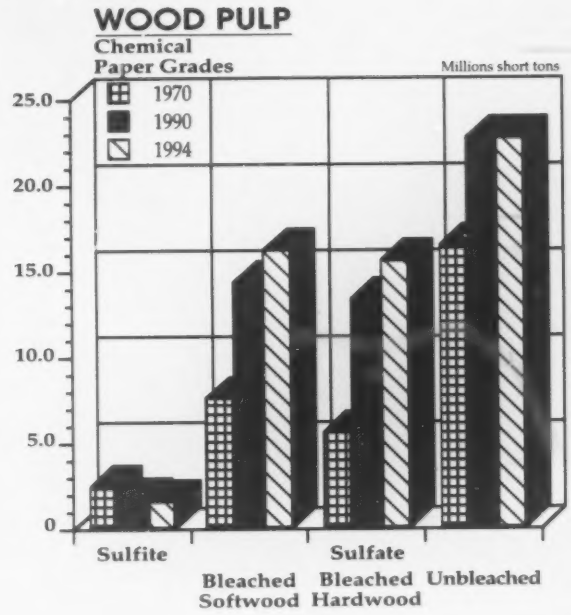
TOTAL WOOD PULP
GRADE DISTRIBUTION 1990



MARKET WOOD PULP
GRADE DISTRIBUTION 1990

CAPACITY/ANNUAL GROWTH COMPARISON





† *Thermomechanical capacity introduced in 1975*

Practical Maximum Basis
Thousands short tons

MARKET WOOD PULP

GRADES	1990	1991	1992	1993	1994*
TOTAL MARKET WOOD PULP	**9,527**	**10,189**	**10,815**	**11,085**	**11,140**
DISSOLVING	1,499	1,500	1,507	1,509	1,517
CHEMICAL PAPER GRADES	8,028	8,689	9,308	9,576	9,623
SULFITE PAPER GRADES	295	309	309	314	315
SULFATE PAPER GRADES	7,733	8,380	8,999	9,262	9,309
Bleached Softwood	4,699	5,068	5,478	5,705	5,753
Bleached Hardwood	2,857	3,130	3,328	3,362	3,362
Unbleached	177	182	193	195	195

* *Capacity additions presented here for 1994 include only presently known commitments and do not necessarily represent final expansion plans of the industry for that year.*

capacity summary annual

Based on information provided by producers. Reflects diversion of drying capacity to and from own use, installation of new equipment and retirement of existing equipment.

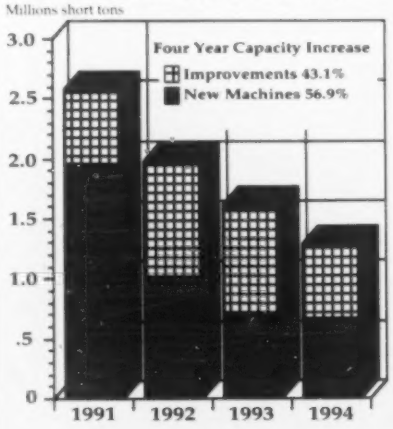
CAPACITY/ANNUAL • YEAR END • DAILY

	ALL GRADES PAPER & PAPER-BOARD Total	PAPER & PAPER-BOARD Total		*Practical Maximum Basis* *Thousands short tons*	PAPER Total	NEWS-PRINT Total	PRINTING & WRITING Total	Uncoated Ground-wood	Coated Ground-wood	Coated Free Sheet	Uncoated Free Sheet
ANNUAL CAPACITY 1990-1994	**86,514**	**84,393**	**1990**	**Annual Capacity**	**42,315**	**6,792**	**24,149**	**1,946**	**4,414**	**3,676**	**12,335**
Annual Capacity includes changes in capacity only for the portion of the year in which they are actually effective	1,939	1,939		New Machines	1,170	269	668	—	15	281	370
	603	628		Net Improvements	281	8	302	(23)	(3)	74	276
	89,056	**86,960**	**1991**	**Annual Capacity**	**43,766**	**7,069**	**25,119**	**1,923**	**4,426**	**4,031**	**12,981**
	996	996		New Machines	815	168	534	—	—	155	379
	1,010	1,010		Net Improvements	400	51	292	7	37	82	122
	91,062	**88,966**	**1992**	**Annual Capacity**	**44,981**	**7,288**	**25,945**	**1,930**	**4,463**	**4,268**	**13,482**
	682	682		New Machines	436	12	295	—	—	146	149
	959	956		Net Improvements	279	80	195	3	57	49	78
	92,703	**90,604**	**1993**	**Annual Capacity**	**45,696**	**7,380**	**26,435**	**1,933**	**4,520**	**4,463**	**13,709**
	644	644		New Machines	470	—	388	—	—	33	355
	632	632		Net Improvements	196	29	160	1	27	120	8
	93,979	**91,880**	**1994***	**Annual Capacity**	**46,362**	**7,409**	**26,983**	**1,934**	**4,547**	**4,616**	**14,072**
YEAR END CAPACITY 1990-1994	**87,667**	**85,566**	**1990**	**Year End Capacity**	**42,786**	**6,948**	**24,388**	**1,932**	**4,380**	**3,947**	**12,413**
Year End Capacity is calculated by multiplying Daily Rate by number of Available Days	1,575	1,575		New Machines	1,048	228	690	—	—	69	621
	532	536		Net Improvements	368	37	285	(1)	55	65	118
	89,774	**87,677**	**1991**	**Year End Capacity**	**44,202**	**7,213**	**25,363**	**1,931**	**4,435**	**4,081**	**13,152**
	676	676		New Machines	640	43	449	—	—	260	189
	1,236	1,236		Net Improvements	600	98	410	2	33	75	259
	91,686	**89,589**	**1992**	**Year End Capacity**	**45,442**	**7,354**	**26,222**	**1,933**	**4,468**	**4,416**	**13,600**
	631	631		New Machines	307	—	175	—	—	38	137
	817	814		Net Improvements	98	27	129	1	64	43	16
	93,134	**91,034**	**1993**	**Year End Capacity**	**45,847**	**7,381**	**26,526**	**1,934**	**4,532**	**4,497**	**13,753**
	572	572		New Machines	463	—	460	—	—	27	433
	575	575		Net Improvements	255	46	171	2	19	130	16
	94,281	**92,181**	**1994***	**Year End Capacity**	**46,565**	**7,427**	**27,157**	**1,936**	**4,551**	**4,654**	**14,202**
YEAR END DAILY RATE 1990-1994	355	356	**1990**	Available Days	356	361	356	361	359	360	354
	246.60	**240.60**		**Daily Rate**	**120.06**	**19.26**	**68.50**	**5.36**	**12.19**	**10.98**	**35.11**
	356	356	**1991**	Available Days	358	361	359	361	359	360	358
	252.52	**246.01**		**Daily Rate**	**123.50**	**19.96**	**70.73**	**5.35**	**12.35**	**11.34**	**36.69**
	356	357	**1992**	Available Days	358	361	359	361	359	360	358
	257.85	**251.30**		**Daily Rate**	**126.95**	**20.36**	**73.11**	**5.35**	**12.44**	**12.27**	**37.94**
	356	357	**1993**	Available Days	358	361	359	361	359	360	358
	261.91	**255.35**		**Daily Rate**	**128.07**	**20.43**	**73.96**	**5.36**	**12.62**	**12.49**	**38.37**
	356	357	**1994***	Available Days	358	361	359	361	359	360	359
	265.07	**258.51**		**Daily Rate**	**130.06**	**20.56**	**75.70**	**5.36**	**12.67**	**12.93**	**39.61**

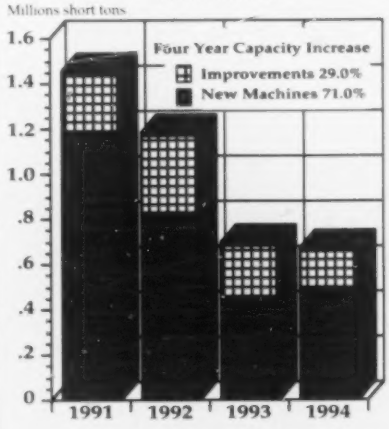
			PACKAGING & INDUSTRIAL CONVERTING					
Cotton Fiber	Thin Papers	Solid Bleached Bristols	Total	Unbleached Kraft	Bleached Packaging & Industrial Converting	Specialty Packaging	Special Industrial	TISSUE Total
202	**262**	**1,314**	**5,369**	**2,710**	**489**	**661**	**1,509**	**6,005**
2	—	—	52	23	4	25	—	181
—	(7)	(15)	(84)	(30)	(9)	6	(51)	55
204	**255**	**1,299**	**5,337**	**2,703**	**484**	**692**	**1,458**	**6,241**
—	—	—	21	3	1	17	—	92
1	—	43	—	(16)	—	1	15	57
205	**255**	**1,342**	**5,358**	**2,690**	**485**	**710**	**1,473**	**6,390**
—	—	—	11	—	—	11	—	118
—	—	8	(24)	(37)	3	1	9	28
205	**255**	**1,350**	**5,345**	**2,653**	**488**	**722**	**1,482**	**6,536**
—	—	—	—	—	—	—	—	82
—	—	4	(8)	(20)	5	1	6	15
205	**255**	**1,354**	**5,337**	**2,633**	**493**	**723**	**1,488**	**6,633**
204	**261**	**1,251**	**5,299**	**2,708**	**481**	**662**	**1,448**	**6,151**
—	—	—	51	12	5	34	—	79
—	(6)	54	(42)	(62)	(2)	5	17	88
204	**255**	**1,305**	**5,308**	**2,658**	**484**	**701**	**1,465**	**6,318**
—	—	—	16	—	—	16	—	132
1	—	40	68	55	1	1	11	24
205	**255**	**1,345**	**5,392**	**2,713**	**485**	**718**	**1,476**	**6,474**
—	—	—	4	—	—	4	—	128
—	—	5	(73)	(87)	5	1	8	15
205	**255**	**1,350**	**5,323**	**2,626**	**490**	**723**	**1,484**	**6,617**
—	—	—	—	—	—	—	—	3
—	—	4	22	13	5	—	4	16
205	**255**	**1,354**	**5,345**	**2,639**	**495**	**723**	**1,488**	**6,636**
324	339	361	352	356	358	348	343	357
0.63	**0.77**	**3.47**	**15.06**	**7.60**	**1.34**	**1.90**	**4.22**	**17.24**
324	339	361	352	355	358	352	343	357
0.63	**0.75**	**3.62**	**15.10**	**7.48**	**1.35**	**1.99**	**4.27**	**17.71**
324	339	361	352	355	358	352	343	357
0.63	**0.75**	**3.73**	**15.33**	**7.64**	**1.36**	**2.04**	**4.30**	**18.14**
324	339	361	352	355	358	352	343	357
0.63	**0.75**	**3.74**	**15.14**	**7.39**	**1.37**	**2.06**	**4.32**	**18.54**
324	339	361	352	355	358	352	343	357
0.63	**0.75**	**3.75**	**15.20**	**7.43**	**1.38**	**2.06**	**4.34**	**18.59**

ANNUAL CAPACITY CHANGES

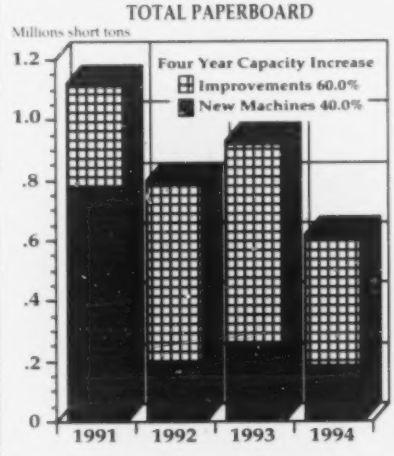
TOTAL PAPER & PAPERBOARD



TOTAL PAPER



TOTAL PAPERBOARD



** Capacity additions presented here for 1994 include only presently known commitments and do not necessarily represent final expansion plans for the industry for that year.*

CAPACITY/ANNUAL • YEAR END • DAILY

			PAPER-BOARD	UNBLEACHED KRAFT PAPERBOARD				SOLID BLEACHED PACKAGING PAPE			
		Practical Maximum Basis Thousands short tons	Total	Total	Liner-board	Folding	Other	Total	Liner-board	Folding	Milk Carton & Food Service
ANNUAL CAPACITY 1990-1994 Annual Capacity includes changes in capacity only for the portion of the year in which they are actually effective	**1990**	**Annual Capacity**	**42,078**	**21,438**	**19,743**	**1,193**	**502**	**4,706**	**190**	**2,243**	**2,027**
		New Machines	769	747	503	244	—	—	—	—	—
		Net Improvements	347	(199)	(257)	28	30	180	(24)	106	57
	1991	**Annual Capacity**	**43,194**	**21,986**	**19,989**	**1,465**	**532**	**4,886**	**166**	**2,349**	**2,084**
		New Machines	181	181	138	43	—	—	—	—	—
		Net Improvements	610	186	182	3	1	81	11	101	(36)
	1992	**Annual Capacity**	**43,985**	**22,353**	**20,309**	**1,511**	**533**	**4,967**	**177**	**2,450**	**2,048**
		New Machines	246	17	17	—	—	75	—	75	—
		Net Improvements	677	(1)	(33)	32	—	80	7	28	41
	1993	**Annual Capacity**	**44,908**	**22,369**	**20,293**	**1,543**	**533**	**5,122**	**184**	**2,553**	**2,089**
		New Machines	174	—	—	—	—	124	—	124	—
		Net Improvements	436	193	173	19	1	107	4	57	45
	1994*	**Annual Capacity**	**45,518**	**22,562**	**20,466**	**1,562**	**534**	**5,353**	**188**	**2,734**	**2,134**
YEAR END CAPACITY 1990-1994 Year End Capacity is calculated by multiplying Daily Rate by number of Available Days	**1990**	**Year End Capacity**	**42,780**	**21,816**	**19,989**	**1,306**	**521**	**4,802**	**154**	**2,271**	**2,093**
		New Machines	527	527	367	160	—	—	—	—	—
		Net Improvements	168	(197)	(253)	44	12	109	13	146	(54)
	1991	**Year End Capacity**	**43,475**	**22,146**	**20,103**	**1,510**	**533**	**4,911**	**167**	**2,417**	**2,039**
		New Machines	36	36	36	—	—	—	—	—	—
		Net Improvements	636	(24)	(24)	—	—	53	11	37	—
	1992	**Year End Capacity**	**44,147**	**22,158**	**20,115**	**1,510**	**533**	**4,964**	**178**	**2,454**	**2,039**
		New Machines	324	—	—	—	—	146	—	146	—
		Net Improvements	716	309	274	35	—	96	7	30	55
	1993	**Year End Capacity**	**45,187**	**22,467**	**20,389**	**1,545**	**533**	**5,206**	**185**	**2,630**	**2,094**
		New Machines	109	—	—	—	—	73	—	73	—
		Net Improvements	320	124	105	18	1	112	4	63	44
	1994*	**Year End Capacity**	**45,616**	**22,591**	**20,494**	**1,563**	**534**	**5,391**	**189**	**2,766**	**2,138**
YEAR END DAILY RATE 1990-1994	**1990**	Available Days	355	357	357	356	358	361	360	360	361
		Daily Rate	**120.54**	**61.17**	**56.04**	**3.67**	**1.46**	**13.33**	**0.43**	**6.31**	**5.80**
	1991	Available Days	355	356	356	356	359	361	362	361	360
		Daily Rate	122.51	62.13	56.40	4.25	1.49	13.62	0.46	6.70	5.66
	1992	Available Days	355	357	357	356	359	361	362	361	360
		Daily Rate	124.35	62.14	56.41	4.25	1.49	13.76	0.49	6.80	5.66
	1993	Available Days	355	357	357	356	359	361	362	361	360
		Daily Rate	127.28	63.01	57.18	4.34	1.49	14.43	0.51	7.28	5.82
	1994*	Available Days	355	357	357	356	359	361	362	361	360
		Daily Rate	128.48	63.36	57.48	4.39	1.49	14.95	0.52	7.66	5.94

** Capacity additions presented here for 1994 include only presently known commitments and do not necessarily represent final expansion plans of the industry for that year.*

ARD	SEMI-CHEMICAL PAPER-BOARD	RECYCLED PAPERBOARD							CONSTRUCTION PAPER & BOARD& WET MACHINE BOARD			
Other	Total	Total	Liner-board	Corru-gating Medium**	Folding	Set-up	Gypsum Wall Board Facing	Other	Total	Constuc-tion Paper	Wet Machine Board	Insu-lating Board
246	**5,894**	**10,040**	**489**	**2,228**	**2,674**	**318**	**1,391**	**2,940**	**2,121**	**833**	**116**	**1,172**
—	—	22	—	13	—	—	—	9	—	—	—	—
41	63	303	184	(14)	136	10	(25)	12	(25)	2	—	(27)
287	**5,957**	**10,365**	**673**	**2,227**	**2,810**	**328**	**1,366**	**2,961**	**2,096**	**835**	**116**	**1,145**
—	—	—	—	—	—	—	—	—	—	—	—	—
5	68	275	175	24	68	2	—	6	—	—	—	—
292	**6,025**	**10,640**	**848**	**2,251**	**2,878**	**330**	**1,366**	**2,967**	**2,096**	**835**	**116**	**1,145**
—	—	154	154	—	—	—	—	—	—	—	—	—
4	44	554	452	12	80	—	—	10	3	—	3	—
296	**6,069**	**11,348**	**1,454**	**2,263**	**2,958**	**330**	**1,366**	**2,977**	**2,099**	**835**	**119**	**1,145**
—	—	50	50	—	—	—	—	—	—	—	—	—
1	28	108	32	12	60	—	—	4	—	—	—	—
297	**6,097**	**11,506**	**1,536**	**2,275**	**3,018**	**330**	**1,366**	**2,981**	**2,099**	**835**	**119**	**1,145**
284	**5,948**	**10,214**	**538**	**2,274**	**2,739**	**326**	**1,366**	**2,971**	**2,101**	**839**	**116**	**1,146**
—	—	—	—	—	—	—	—	—	—	—	—	—
4	4	252	190	(40)	111	4	—	(13)	(4)	(3)	—	(1)
288	**5,952**	**10,466**	**728**	**2,234**	**2,850**	**330**	**1,366**	**2,958**	**2,097**	**836**	**116**	**1,145**
—	—	—	—	—	—	—	—	—	—	—	—	—
5	82	525	452	23	38	—	—	12	—	—	—	—
293	**6,034**	**10,991**	**1,180**	**2,257**	**2,888**	**330**	**1,366**	**2,970**	**2,097**	**836**	**116**	**1,145**
—	—	178	178	—	—	—	—	—	—	—	—	—
4	46	265	130	12	113	1	—	9	3	—	3	—
297	**6,080**	**11,434**	**1,488**	**2,269**	**3,001**	**331**	**1,366**	**2,979**	**2,100**	**836**	**119**	**1,145**
—	—	36	36	—	—	—	—	—	—	—	—	—
1	21	63	24	11	24	—	—	4	—	—	—	—
298	**6,101**	**11,533**	**1,548**	**2,280**	**3,025**	**331**	**1,366**	**2,983**	**2,100**	**836**	**119**	**1,145**
359	356	348	358	354	348	338	344	345	321	342	288	310
0.79	**16.71**	**29.33**	**1.50**	**6.42**	**7.86**	**0.97**	**3.97**	**8.61**	**6.55**	**2.45**	**0.40**	**3.70**
361	356	348	359	354	348	338	344	345	320	341	288	310
0.80	**16.70**	**30.06**	**2.03**	**6.31**	**8.19**	**0.98**	**3.97**	**8.58**	**6.55**	**2.45**	**0.40**	**3.70**
361	356	349	358	354	348	338	344	345	320	341	289	310
0.81	**16.93**	**31.52**	**3.30**	**6.37**	**8.30**	**0.98**	**3.97**	**8.61**	**6.55**	**2.45**	**0.40**	**3.70**
361	356	349	358	354	348	338	344	345	320	341	289	310
0.82	**17.06**	**32.78**	**4.16**	**6.41**	**8.62**	**0.98**	**3.97**	**8.64**	**6.56**	**2.45**	**0.41**	**3.70**
361	356	349	358	354	348	338	344	345	320	341	289	310
0.82	**17.12**	**33.05**	**4.33**	**6.44**	**8.69**	**0.98**	**3.97**	**8.65**	**6.56**	**2.45**	**0.41**	**3.70**

** *Includes Container Chip & Filler*

CAPACITY/ANNUAL • YEAR END • DAILY

			ALL GRADES WOOD PULP	WOOD PULP FOR PAPER & BOARD	DISSOLVING	CHEMICAL PAPER GRADES				
							SULFITE	SULFATE			
									Bleached		
	Practical Maximum Basis								Hardwood	Softwood	Unbleached
	Thousands short tons		Total	Total	Total	Total	Total	Total			
ANNUAL CAPACITY 1990-1994	**1990**	**Annual Capacity**	**65,985**	**65,367**	**1,486**	**52,250**	**1,689**	**50,561**	**13,407**	**14,412**	**22,742**
		New Machines	1,254	1,254	—	1,182	—	1,182	510	433	239
		Net Improvements	163	175	7	238	8	230	130	178	(78)
Annual Capacity includes changes in capacity only for the portion of the year in which they are actually effective.	**1991**	**Annual Capacity**	**67,402**	**66,796**	**1,493**	**53,670**	**1,697**	**51,973**	**14,047**	**15,023**	**22,903**
		New Machines	1,262	1,262	—	1,262	—	1,2[illegible]	768	451	43
		Net Improvements	313	313	—	391	9	[illegible]82	104	162	116
	1992	**Annual Capacity**	**68,977**	**68,371**	**1,493**	**55,323**	**1,706**	**53,617**	**14,919**	**15,636**	**23,062**
		New Machines	618	618	—	618	—	618	346	272	—
		Net Improvements	(289)	(289)	—	(254)	(51)	(203)	54	52	(309)
	1993	**Annual Capacity**	**69,306**	**68,700**	**1,493**	**55,687**	**1,655**	**54,032**	**15,319**	**15,960**	**22,753**
		New Machines	392	392	—	392	—	392	212	180	—
		Net Improvements	192	192	—	178	(4)	182	74	110	(2)
	1994*	**Annual Capacity**	**69,890**	**69,284**	**1,493**	**56,257**	**1,651**	**54,606**	**15,605**	**16,250**	**22,751**
YEAR END CAPACITY 1990-1994	**1990**	**Year End Capacity**	**66,871**	**66,265**	**1,493**	**53,030**	**1,689**	**51,341**	**13,552**	**14,828**	**22,961**
		New Machines	1,445	1,445	—	1,445	—	1,445	1,033	256	156
		Net Improvements	(12)	(12)	—	194	9	185	90	170	(75)
Year End Capacity is calculated by multiplying Daily Rate by number of Available Days	**1991**	**Year End Capacity**	**68,304**	**67,698**	**1,493**	**54,669**	**1,698**	**52,971**	**14,675**	**15,254**	**23,042**
		New Machines	665	665	—	665	—	665	253	410	2
		Net Improvements	(72)	(72)	—	(35)	9	(44)	120	63	(227)
	1992	**Year End Capacity**	**68,897**	**68,291**	**1,493**	**55,299**	**1,707**	**53,592**	**15,048**	**15,727**	**22,817**
		New Machines	664	664	—	664	—	664	407	257	—
		Net Improvements	8	8	—	(17)	(56)	39	15	100	(76)
	1993	**Year End Capacity**	**69,569**	**68,963**	**1,493**	**55,946**	**1,651**	**54,295**	**15,470**	**16,084**	**22,741**
		New Machines	236	236	—	236	—	236	117	119	—
		Net Improvements	165	165	—	151	—	151	59	81	11
	1994*	**Year End Capacity**	**69,970**	**69,364**	**1,493**	**56,333**	**1,651**	**54,682**	**15,646**	**16,284**	**22,752**
YEAR END DAILY RATE 1990-1994	**1990**	Available Days	359	359	354	359	357	359	360	360	358
		Daily Rate	**186.52**	**184.59**	**4.21**	**147.78**	**4.73**	**143.05**	**37.70**	**41.16**	**64.19**
	1991	Available Days	359	359	354	359	357	359	360	360	358
		Daily Rate	**190.52**	**188.57**	**4.21**	**152.34**	**4.76**	**147.58**	**40.81**	**42.34**	**64.43**
	1992	Available Days	359	359	354	359	357	359	360	360	358
		Daily Rate	**192.17**	**190.21**	**4.21**	**154.08**	**4.78**	**149.30**	**41.85**	**43.67**	**63.78**
	1993	Available Days	359	359	354	359	357	359	360	360	358
		Daily Rate	**194.02**	**192.06**	**4.21**	**155.86**	**4.62**	**151.24**	**43.02**	**44.66**	**63.56**
	1994*	Available Days	359	359	354	359	357	359	360	360	358
		Daily Rate	**195.13**	**193.17**	**4.21**	**156.93**	**4.62**	**152.31**	**43.51**	**45.21**	**63.59**

** Capacity additions presented here for 1994 include only presently known commitments and do not necessarily represent final expansion plans of the industry for that year.*

SEMICHEMICAL			MECHANICAL				SCREEN-INGS	WOOD PULP FOR CONSTRUCTION PAPER & BOARD		
Total	Bleached	Un-bleached	Total	Stone Groundwood	Refiner	Thermo-mechanical	Total	Total	Stone Ground-wood & Refiner	Defib-rated/ Exploded†
4,669	**366**	**4,303**	**6,957**	**3,073**	**347**	**3,537**	**5**	**618**	**161**	**457**
—	—	—	72	40	—	32	—	—	—	—
(122)	(37)	(85)	52	(34)	(13)	99	—	(12)	—	(12)
4,547	329	4,218	7,081	3,079	334	3,668	5	606	161	445
—	—	—	—	—	—	—	—	—	—	—
(74)	(2)	(72)	(4)	3	(19)	12	—	—	—	—
4,473	327	4,146	7,077	3,082	315	3,680	5	606	161	445
—	—	—	—	—	—	—	—	—	—	—
—	—	—	(35)	13	—	(48)	—	—	—	—
4,473	327	4,146	7,042	3,095	315	3,632	5	606	161	445
—	—	—	—	—	—	—	—	—	—	—
—	—	—	14	11	—	3	—	—	—	—
4,473	327	4,146	7,056	3,106	315	3,635	5	606	161	445
4,667	**354**	**4,313**	**7,070**	**3,081**	**341**	**3,648**	**5**	**606**	**161**	**445**
—	—	—	—	—	—	—	—	—	—	—
(194)	(27)	(167)	(12)	(9)	(25)	22	—	—	—	—
4,473	327	4,146	7,058	3,072	316	3,670	5	606	161	445
—	—	—	—	—	—	—	—	—	—	—
—	—	—	(37)	11	—	(48)	—	—	—	—
4,473	327	4,146	7,021	3,083	316	3,622	5	606	161	445
—	—	—	—	—	—	—	—	—	—	—
—	—	—	25	13	—	12	—	—	—	—
4,473	327	4,146	7,046	3,096	316	3,634	5	606	161	445
—	—	—	—	—	—	—	—	—	—	—
—	—	—	14	12	—	2	—	—	—	—
4,473	327	4,146	7,060	3,108	316	3,636	5	606	161	445
358	359	358	362	362	361	362	364	309	333	301
13.05	**0.99**	**12.06**	**19.53**	**8.51**	**0.94**	**10.08**	**0.01**	**1.96**	**0.48**	**1.48**
358	359	357	362	362	361	362	364	309	333	301
12.51	**0.91**	**11.60**	**19.49**	**8.48**	**0.87**	**10.14**	**0.01**	**1.96**	**0.48**	**1.48**
358	359	357	362	362	361	362	364	309	333	301
12.51	**0.91**	**11.60**	**19.39**	**8.51**	**0.87**	**10.01**	**0.01**	**1.96**	**0.48**	**1.48**
358	359	357	362	362	361	362	364	309	333	301
12.51	**0.91**	**11.60**	**19.46**	**8.55**	**0.87**	**10.04**	**0.01**	**1.96**	**0.48**	**1.48**
358	359	357	362	362	361	362	364	309	333	301
12.51	**0.91**	**11.60**	**19.50**	**8.58**	**0.87**	**10.05**	**0.01**	**1.96**	**0.48**	**1.48**

† Excludes the defibrated/exploded pulp capacity of mills that produce hard pressed board

PAPER & PAPERBOARD

TOTAL U.S. CAPACITY		GRADES	NEW ENGLAND		MID-ATLANTIC	
1990	**1994**	*Practical Maximum Basis/Thousands short tons*	**1990**	**1994**	**1990**	**1994**
86,514	**93,979**	**Total All Grades Paper & Paperboard**	**6,273**	**6,588**	**5,770**	**6,097**
84,393	**91,880**	**TOTAL PAPER & PAPERBOARD**	**6,219**	**6,534**	**5,442**	**5,769**
42,315	**46,362**	**Total Paper**	**5,229**	**5,493**	**3,986**	**4,199**
6,792	7,409	NEWSPRINT	n.a.	n.a.	n.a.	n.a.
24,149	26,983	PRINTING & WRITING	3,876	4,185	2,411	2,513
1,946	1,934	Uncoated Groundwood	604	597	n.a	n.a.
4,414	4,547	Coated Groundwood	1,267	1,252	234	259
3,676	4,616	Coated Free Sheet	653	911	254	258
12,799	14,532	Uncoated Free Sheet (1)	1,334	1,402	1,756	1,853
1,314	1,354	Solid Bleached Bristols	18	23	n.a.	n.a.
5,369	5,337	PACKAGING & INDUSTRIAL CONVERTING	467	440	319	359
6,005	6,633	TISSUE	540	543	1,033	1,094
42,078	**45,518**	**Total Paperboard**	**990**	**1,041**	**1,456**	**1,570**
21,438	22,562	UNBLEACHED KRAFT	—	—	—	—
19,743	20,466	of which Kraft Linerboard	—	—	—	—
4,706	5,353	SOLID BLEACHED	—	—	—	—
5,894	6,097	SEMICHEMICAL	n.a.	n.a.	—	—
10,040	11,506	RECYCLED	881	916	1,456	1,570
2,717	3,811	Containerboard	145	146	315	320
7,323	7,695	All Other Recycled	736	770	1,141	1,250
2,121	**2,099**	**Total Construction Paper & Board**	**54**	**54**	**328**	**328**

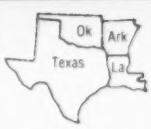
WOOD PULP

65,985	**69,890**	**Total All Grades Wood Pulp**	**3,429**	**3,509**	**1,405**	**1,378**
65,367	**69,284**	**TOTAL WOOD PULP FOR PAPER & BOARD**	**3,384**	**3,464**	**1,405**	**1,378**
1,486	1,493	DISSOLVING	—	—	—	—
1,689	1,651	SULFITE PAPER GRADES	n.a.	n.a.	n.a.	n.a.
50,566	54,611	SULFATE PAPER GRADES	2,147	2,192	543	554
14,412	16,250	Bleached Softwood	644	733	169	179
13,407	15,605	Bleached Hardwood	1,468	1,457	374	375
22,747	22,756	Unbleached (2)	n.a.	n.a.	—	—
4,669	4,473	SEMICHEMICAL	n.a.	n.a.	388	351
6,957	7,056	MECHANICAL	959	987	172	175
618	**606**	**Wood Pulp for Construction Paper & Board (3)**	**45**	**45**	—	—

MARKET PULP

9,527	**11,140**	**Total Market Pulp**	**430**	**444**	—	—
8,028	9,623	Chemical Paper Grades	430	444	—	—

(1) Includes cotton fibers and thin papers. (2) Includes screenings. (3) Excludes defibrated/exploded pulp capacity of mills that produce hard pressed board.

EAST NORTH CENTRAL		WEST NORTH CENTRAL		SOUTH ATLANTIC		EAST SOUTH CENTRAL		 WEST SOUTH CENTRAL		MOUNTAIN & PACIFIC*		LOCATION UNCERTAIN	
1990	**1994**	**1990**	**1994**	**1990**	**1994**	**1990**	**1994**	**1990**	**1994**	**1990**	**1994**	**1990**	**1994**
13,646	**14,819**	**2,204**	**2,653**	**20,695**	**22,327**	**12,048**	**13,310**	**13,373**	**14,728**	**12,505**	**13,200**	—	**257**
13,340	**14,509**	**2,029**	**2,471**	**20,260**	**21,912**	**11,646**	**12,916**	**13,045**	**14,406**	**12,412**	**13,106**	—	**257**
8,269	**8,915**	**1,504**	**1,943**	**6,923**	**7,450**	**4,975**	**5,516**	**5,532**	**6,127**	**5,897**	**6,462**	—	**257**
n.a.	n.a.	—	—	1,304	1,340	1,375	1,549	1,292	1,329	2,055	2,433	—	—
5,515	5,906	1,475	1,914	3,493	4,021	2,711	2,991	2,656	3,175	2,012	2,021	—	257
278	269	385	416	n.a.	n.a.	198	201	n.a.	n.a.	274	270	—	—
1,280	1,302	n.a.	n.a.	n.a.	n.a.	208	209	n.a.	n.a.	43	39	—	—
1,243	1,641	n.a.	n.a.	n.a.	n.a.	400	572	n.a.	n.a.	204	217	—	—
2,588	2,585	183	494	2,066	2,583	1,800	1,880	1,624	2,023	1,448	1,455	—	257
126	109	—	—	579	577	n.a.	n.a.	433	468	43	40	—	—
1,035	1,107	n.a.	n.a.	1,362	1,212	205	194	1,121	1,097	831	899	—	—
1,522	1,702	—	—	764	877	684	782	463	526	999	1,109	—	—
5,071	**5,594**	**525**	**528**	**13,337**	**14,462**	**6,671**	**7,400**	**7,513**	**8,279**	**6,515**	**6,644**	—	—
—	—	—	—	8,918	9,060	4,412	4,819	4,628	5,298	3,480	3,385	—	—
—	—	—	—	8,391	8,528	3,895	3,960	4,018	4,640	3,439	3,338	—	—
n.a.	n.a.	—	—	1,776	2,215	794	808	1,591	1,659	544	670	—	—
1,910	1,910	n.a.	n.a.	1,243	1,278	990	1,067	860	891	705	752	—	—
3,160	3,683	448	454	1,400	1,909	475	706	434	431	1,786	1,837	—	—
837	1,176	146	146	221	718	n.a.	n.a.	65	66	988	1,035	—	—
2,323	2,507	302	308	1,179	1,191	475	502	369	365	798	802	—	—
306	**310**	**175**	**182**	**435**	**415**	**402**	**394**	**328**	**322**	**93**	**94**	—	—
4,174	**4,086**	**841**	**1,029**	**20,630**	**21,629**	**12,573**	**14,247**	**12,108**	**12,946**	**10,825**	**10,820**	—	**246**
4,093	**4,004**	**795**	**983**	**20,496**	**21,506**	**12,427**	**14,100**	**12,004**	**12,845**	**10,763**	**10,758**	—	**246**
—	—	—	—	548	549	n.a.	n.a.	—	—	645	641	—	—
361	323	—	—	—	—	—	—	—	—	838	835	—	—
1,826	1,858	337	473	18,072	19,266	10,189	11,697	10,233	11,022	7,219	7,303	—	246
417	418	n.a.	n.a.	4,970	5,307	2,559	3,270	2,479	2,668	3,113	3,457	—	125
1,164	1,195	n.a.	n.a.	3,725	4,698	3,627	4,116	2,528	3,008	255	266	—	121
n.a.	n.a.	n.a.	n.a.	9,377	9,261	4,003	4,311	5,226	5,346	3,851	3,580	—	—
1,409	1,323	n.a.	n.a.	907	827	660	675	664	665	502	495	—	—
497	500	409	463	969	864	1,285	1,425	1,107	1,158	1,559	1,484	—	—
81	**82**	**46**	**46**	**134**	**123**	**146**	**147**	**104**	**101**	**62**	**62**	—	—
n.a.	**n.a.**	—	—	**3,822**	**4,459**	**2,241**	**3,070**	**671**	**771**	**2,073**	**2,195**	—	—
n.a.	n.a.	—	—	3,273	3,910	1,948	2,743	671	771	1,416	1,554	—	—

n.a.— not available **Includes Alaska*

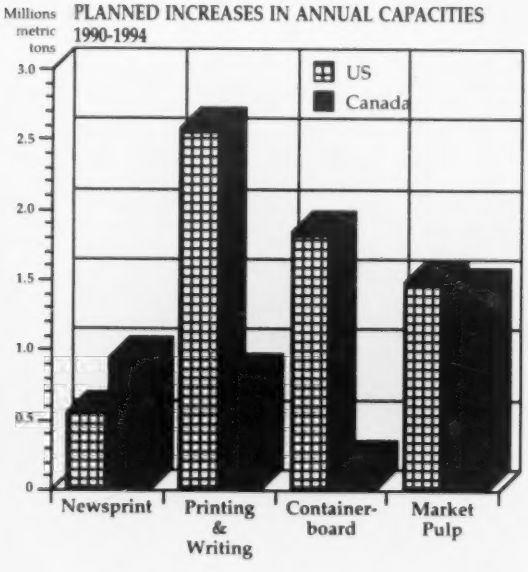
Thousands metric tons

WOOD PULP (EXCEPT DEFIBRATED/EXPLODED & SCREENINGS)

	TOTALS		Percent Increase	MECHANICAL		SEMICHEMICAL		CHEMICAL PAPER GRADES		
	1990	1994		1990	1994	1990	1994	1990	1994	of which 1990
WORLD TOTAL	**173,712**	**187,816**	**8.1**	**43,635**	**47,633**	**9,240**	**9,189**	**115,584**	**126,064**	**32,204**
DEVELOPED MARKET ECONOMIES	**142,400**	**152,762**	**7.3**	**37,033**	**40,363**	**7,444**	**7,231**	**94,380**	**101,780**	**25,244**
NORTH AMERICA	**85,967**	**91,492**	6.4	18,682	20,079	4,740	4,581	60,950	65,230	14,743
U.S.	**59,442**	**62,996**	6.0	6,457	6,547	4,236	4,058	47,401	51,036	7,283
Canada	**26,525**	**28,496**	7.4	12,225	13,532	504	523	13,549	14,194	7,460
JAPAN	**13,809**	**15,249**	10.4	3,436	3,502	949	897	9,099	10,525	774
WESTERN EUROPE	**38,071**	**41,427**	8.8	13,367	15,254	1,274	1,240	22,227	23,892	9,037
E.E.C.	**7,798**	**9,229**	18.4	3,568	4,442	291	212	3,742	4,442	1,182
Nordic Countries	**23,905**	**25,525**	6.8	8,685	9,655	915	960	13,620	14,330	5,355
Rest of Western Europe	**6,368**	**6,673**	4.8	1,114	1,157	68	68	4,865	5,120	2,500
OCEANIA	**2,683**	**2,724**	1.5	1,178	1,158	317	349	1,188	1,217	300
OTHERS	**1,870**	**1,870**	—	370	370	164	164	916	916	390
DEVELOPING MARKET ECONOMIES	**12,167**	**17,080**	**40.4**	**2,106**	**3,180**	**706**	**856**	**8,957**	**12,596**	**3,479**
AFRICA	**1,032**	**1,116**	8.1	123	143	32	37	847	906	415
LATIN AMERICA	**8,127**	**12,462**	53.3	1,210	2,074	338	393	6,481	9,897	2,615
of which Brazil	**5,082**	**7,888**	55.2	556	1,082	81	105	4,361	6,617	1,755
Mexico	**833**	**862**	3.5	325	325	—	—	508	537	—
ASIA	**3,008**	**3,502**	16.4	773	963	336	426	1,629	1,793	449
CENTRALLY PLANNED ECONOMIES	**19,145**	**17,974**	**(6.1)**	**4,496**	**4,090**	**1,090**	**1,102**	**12,247**	**11,688**	**3,481**
of which USSR	**12,415**	**12,415**	—	3,000	3,000	635	635	8,000	8,000	2,660

*No data available for 1994.

NORTH AMERICA



MARKET WOOD PULP

NORTH AMERICA	1990	1991	1992	1993
TOTAL MARKET WOOD PULP	**17,454**	**18,743**	**19,803**	**20,285**
DISSOLVING	1,607	1,608	1,614	1,616
CHEMICAL PAPER GRADES	14,743	15,776	16,530	16,818
Sulfite	584	581	582	588
Sulfate	14,159	15,194	15,948	16,230
MECHANICAL	1,104	1,359	1,659	1,851

* Canadian capacity changes for 1994 not available.

Source: Food and Agriculture Organization of the United Nations, Canadian Pulp & Paper Association, American Paper Institute.

Thousands metric tons

PAPER & PAPERBOARD (EXCEPT INSULATING & HARD PRESSED BOARD)

	DISSOLVING		TOTALS			NEWSPRINT		PRINTING & WRITING		WRAPPING & PACKAGING		ALL OTHERS	
market 1993*	1990	1994	1990	1994	Percent Increase	1990	1994	1990	1994	1990	1994	1990	1994
36,241	**5,253**	**4,929**	**260,815**	**295,762**	**13.4**	**36,338**	**41,134**	**74,678**	**89,806**	**116,410**	**128,821**	**33,389**	**36,000**
27,462	**3,543**	**3,387**	**200,554**	**230,468**	**14.9**	**30,401**	**34,416**	**61,327**	**74,578**	**85,443**	**95,914**	**23,383**	**25,559**
16,818	1,595	1,601	95,608	104,564	9.4	16,262	17,746	25,826	29,221	43,724	47,192	9,796	10,404
8,687	1,348	1,354	77,423	84,220	8.8	6,162	6,721	21,908	24,479	40,176	43,316	9,177	9,703
8,131	247	247	18,185	20,344	11.9	10,100	11,025	3,918	4,742	3,548	3,876	619	701
888	325	325	30,728	36,680	19.4	3,756	4,457	9,802	12,898	12,563	14,119	4,607	5,206
9,066	1,203	1,041	69,079	83,913	21.5	9,156	10,934	24,903	31,609	26,553	31,964	8,467	9,406
1,218	197	133	36,675	45,701	24.6	3,138	4,528	13,880	17,287	14,128	17,677	5,529	6,209
5,275	685	580	20,725	24,058	16.1	4,910	5,102	7,425	9,598	7,160	8,146	1,230	1,212
2,573	321	328	11,679	14,154	21.2	1,108	1,304	3,598	4,724	5,265	6,141	1,708	1,985
300	—	—	3,058	3,225	5.5	785	837	424	474	1,533	1,568	316	346
390	420	420	2,081	2,086	0.2	442	442	372	376	1,070	1,071	197	197
5,395	**398**	**448**	**27,046**	**33,264**	**23.0**	**2,807**	**3,727**	**6,796**	**8,861**	**14,723**	**17,711**	**2,720**	**2,965**
430	30	30	1,013	1,210	19.4	137	149	353	396	473	605	50	60
4,299	98	98	13,528	16,631	22.9	1,126	1,695	3,023	4,428	7,449	8,390	1,930	2,118
2,670	84	84	5,764	7,589	31.7	258	574	1,542	2,625	3,251	3,579	713	811
—	—	—	3,611	4,288	18.7	430	465	628	759	2,040	2,535	513	529
666	270	320	12,505	15,423	23.3	1,544	1,883	3,420	4,037	6,801	8,716	740	787
3,384	**1,312**	**1,094**	**33,215**	**32,030**	**(3.6)**	**3,130**	**2,991**	**6,555**	**6,367**	**16,244**	**15,196**	**7,286**	**7,476**
2,660	780	780	12,800	12,800	—	1,950	1,950	1,500	1,500	6,980	6,980	2,370	2,370

Thousands metric tons

1994*	Percent Increase
20,336	**16.5**
1,623	1.0
16,862	14.4
589	0.9
16,273	14.9
1,851	67.7

Thousands metric tons

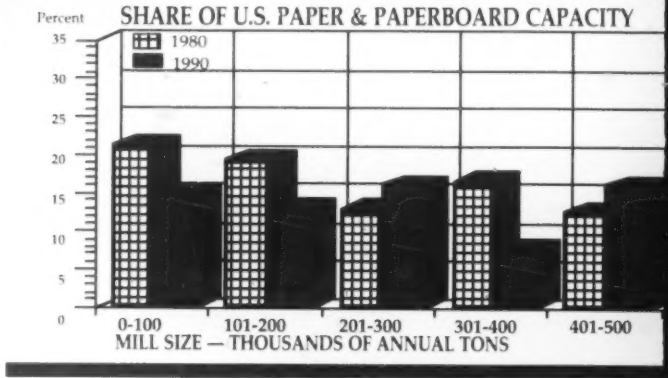
PAPER & PAPERBOARD (EXCEPT INSULATING & HARD PRESSED BOARD)

NORTH AMERICA	1990	1991	1992	1993	1994*	Percent Increase
TOTAL PAPER AND PAPERBOARD	**95,607**	**98,884**	**101,579**	**103,234**	**104,720**	**9.5**
PAPER	**53,550**	**55,640**	**57,532**	**58,320**	**59,086**	**10.3**
NEWSPRINT	16,262	16,843	17,537	17,685	17,746	9.1
PRINTING & WRITING	25,826	27,085	28,092	28,605	29,221	13.1
Wood Containing	8,145	8,434	8,643	8,700	8,818	8.3
Wood Free	17,681	18,651	19,450	19,905	20,403	15.4
TISSUE	6,041	6,293	6,460	6,597	6,690	10.8
PACKAGING & IND. CONV.	5,422	5,419	5,443	5,433	5,428	0.1
PAPERBOARD	**42,057**	**43,244**	**44,047**	**44,914**	**45,634**	**8.5**
CONTAINERBOARD	28,040	28,600	29,191	29,785	30,060	7.2
Linerboard	19,903	20,337	20,839	21,386	21,625	8.7
Corrugating	8,137	8,263	8,352	8,399	8,435	3.7
ALL OTHER PAPERBOARD	14,017	14,645	14,856	15,130	15,575	11.1

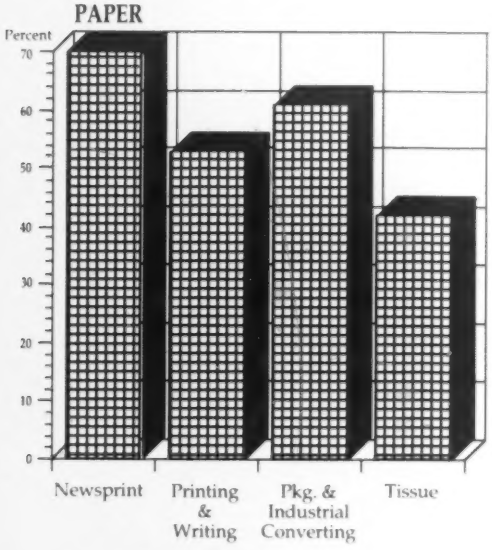
MILL SIZE-PAPER, PAPERBOARD & WOOD PULP

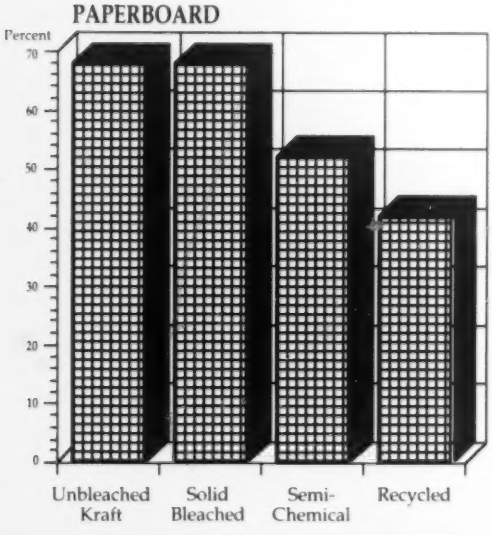
ANNUAL CAPACITY RANGE*	PAPER & PAPERBOARD		WOOD PULP	
	Number of Mills	Share of Total Capacity	Number of Mills	Share of Total Capacity
TOTAL	544	100%	210	100%
0-25	124	1.9	13	0.3
26-50	86	3.6	12	0.7
51-75	69	5.1	6	0.6
76-100	42	4.3	16	2.1
101-125	27	3.5	11	1.9
126-150	22	3.5	10	2.1
151-175	16	3.0	7	1.7
176-200	13	2.9	9	2.6
201-250	38	9.9	20	6.8
251-300	18	5.9	15	6.2
301-350	7	2.7	7	3.4
351-400	12	5.2	14	7.9
401-450	12	5.9	11	7.2
451-500	18	9.9	14	10.1
over 500	40	32.7	45	46.4

* Thousands short tons



SHARE OF MACHINE CAPACITY INSTALLED OR REBUILT WITHIN THE PAST TEN YEARS





MACHINES
PAPER & PAPERBOARD

SIZE OF MACHINES-BY PRINCIPAL G

PAPER

MACHINE ANNUAL CAPACITY Thousands short tons	NEWSPRINT		PRINTING & WRITING	
	Number of Machines	Share of Total Capacity	Number of Machines	Shar To Capa
TOTAL	43	100%	415	100
0-5	—	—	38	1
6-10	—	—	33	1
11-15	—	—	24	1
16-20	—	—	15	1
21-30	—	—	51	5
31-40	1	1	49	7
41-50	1	1	34	6
51-75	4	4	61	15
76-100	4	5	39	14
101-125	2	3	18	8
126-150	12	25	14	8
151-200	8	20	24	18
201-250	9	33	10	9
251-300	2	8	4	4
301-400	—	—	—	—
over 400	—	—	1	2

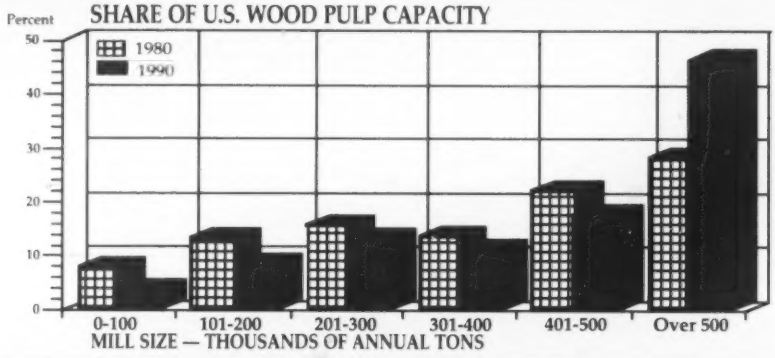
All data based on machines in place January 1990.

AGE OF MACHINES-BY PRINCIPAL GRADE PRODUCED

PAPER

YEAR MACHINE INSTALLED OR REBUILT*	NEWSPRINT		PRINTING & WRITING		PACKAGING & IND. CONV.		TI
	Number of Machines	Share of Total Capacity	Number of Machines	Share of Total Capacity	Number of Machines	Share of Total Capacity	Number Machine
TOTAL	43		415		169		205
No Data Available	—		58		15		35
Total Sample	43	100%	357	100%	154	100%	170
1989	8	21	17	7	5	1	4
1988	5	12	24	10	13	10	7
1987	2	4	17	5	5	4	4
1986	2	3	21	8	7	12	4
1985	2	4	20	5	5	4	9
1984	4	7	15	6	4	6	5
1983	3	3	11	3	8	5	6
1982	2	4	17	5	9	10	2
1981	3	9	12	4	6	9	7
1976-1980	7	22	59	14	13	8	33
1971-1975	1	3	33	10	20	7	11
1966-1970	2	5	42	13	21	9	31
1961-1965	—	—	37	7	15	4	24
1956-1960	2	3	10	1	5	1	5
1951-1955	—	—	9	1	5	3	1
Prior to 1951	—	—	13	1	13	7	17

All data based on machines in place January 1990.



MILLS
PAPER
PAPERBOARD
WOOD PULP

DE PRODUCED

PACKAGING & IND. CONV.		TISSUE	
Number of Machines	Share of Total Capacity	Number of Machines	Share of Total Capacity
169	100%	205	100%
29	2	15	1
43	6	26	4
17	4	25	6
22	7	22	7
20	9	35	15
4	3	26	15
6	5	26	20
4	4	26	27
4	6	4	6
6	12	—	—
5	12	—	—
7	20	—	—
1	4	—	—
—	—	—	—
1	6	—	—
—	—	—	—

PAPERBOARD

MACHINE ANNUAL CAPACITY Thousands short tons	UNBLEACHED KRAFT		SOLID BLEACHED		SEMICHEMICAL		RECYCLED		CONSTRUCTION GRADES	
	Number of Machines	Share of Total Capacity	Number of Machines	Share of Total Capacity	Number of Machines	Share of Total Capacity	Number of Machines	Share of Total Capacity	Number of Machines	Share of Total Capacity
TOTAL	68	100%	28	100%	38	100%	184	100%	56	100%
0-5	—	—	—	—	—	—	6	—	6	1
6-10	—	—	—	—	—	—	2	—	6	2
11-15	—	—	—	—	—	—	6	1	6	4
16-20	—	—	—	—	—	—	11	2	5	4
21-30	—	—	—	—	—	—	29	8	6	7
31-40	1	—	—	—	1	1	29	11	7	12
41-50	—	—	1	1	—	—	24	12	6	13
51-75	1	—	2	2	6	7	47	30	6	18
76-100	2	1	1	1	1	2	15	13	6	26
101-125	2	1	1	2	8	15	7	8	1	6
126-150	2	1	1	3	7	16	2	3	1	7
151-200	9	8	11	34	5	14	4	7	—	—
201-250	10	12	6	24	5	19	1	2	—	—
251-300	9	13	1	5	3	14	1	3	—	—
301-400	22	39	3	18	2	12	—	—	—	—
over 400	10	25	1	10	—	—	—	—	—	—

E	
Share of Total Capacity	
100%	
3	
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5	
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PAPERBOARD

YEAR MACHINE INSTALLED OR REBUILT*	UNBLEACHED KRAFT		SOLID BLEACHED		SEMICHEMICAL		RECYCLED		CONSTRUCTION GRADES	
	Number of Machines	Share of Total Capacity	Number of Machines	Share of Total Capacity	Number of Machines	Share of Total Capacity	Number of Machines	Share of Total Capacity	Number of Machines	Share of Total Capacity
TOTAL	68		28		38		184		56	
No Data Available	—		—		—		30		19	
Total Sample	68	100%	28	100%	38	100%	154	100%	37	100%
1989	5	8	1	3	5	20	5	5	—	—
1988	12	21	3	7	1	4	11	5	2	8
1987	3	4	2	9	3	9	7	7	2	5
1986	5	9	6	31	2	6	4	2	—	—
1985	5	8	2	7	1	3	11	8	2	11
1984	2	2	—	—	1	2	4	3	1	—
1983	1	1	—	—	—	—	5	3	—	—
1982	2	3	1	3	2	6	5	5	—	—
1981	2	4	1	6	1	2	7	5	2	9
1976-1980	14	21	4	14	6	12	19	15	4	9
1971-1975	4	5	2	7	10	21	22	15	10	30
1966-1970	3	3	1	3	4	11	13	6	6	7
1961-1965	3	4	2	6	1	2	7	3	2	7
1956-1960	1	1	2	2	1	2	4	3	2	8
1951-1955	2	2	1	2	—	—	8	5	—	—
Prior to 1951	4	4	—	—	—	—	22	10	4	6

*Rebuilds include only modifications which significantly extended the useful life or increased the capacity of a machine.

Thousands short tons

FIBER CONSUMPTION IN PAPER & PAPERBOARD MANUFACTURE

	Total U.S.	Percent of Total Fiber	New England	Mid-Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain & Pacific	Location Uncertain
1990											
TOTAL FIBER	**82,588**	**100.0**	**5,503**	**5,206**	**12,426**	**1,793**	**20,036**	**11,853**	**13,393**	**12,378**	—
TOTAL WOOD PULP	60,311	73.0	3,926	2,726	6,264	1,189	16,001	10,152	11,410	8,643	—
Manufactured on-site	51,250	62.1	2,349	1,170	2,933	787	15,259	9,789	11,302	7,661	—
*Purchased	6,192	7.5	947	1,057	2,434	283	396	289	74	712	—
*Transferred	2,869	3.5	630	499	897	119	346	74	34	270	—
†TOTAL RECOVERED PAPER	22,009	26.6	1,502	2,454	6,117	584	4,024	1,669	1,934	3,725	—
Mixed Papers	2,505	3.0	162	267	714	88	490	202	222	360	—
Newspapers	4,085	4.9	230	720	1,006	108	892	70	186	873	—
Corrugated	10,687	12.9	503	797	2,593	338	2,209	1,150	969	2,128	—
Pulp Substitutes	2,732	3.3	418	416	747	30	261	223	329	308	—
High Grade Deinking	2,000	2.4	189	254	1,057	20	172	24	228	56	—
OTHER FIBERS	268	0.3	75	26	45	20	11	32	49	10	—
1991											
TOTAL FIBER	**85,656**	**100.0**	**5,666**	**5,323**	**13,043**	**1,949**	**21,022**	**12,219**	**13,940**	**12,494**	—
TOTAL WOOD PULP	61,584	71.9	3,973	2,716	6,378	1,320	16,684	10,300	11,852	8,361	—
Manufactured on-site	52,497	61.3	2,484	1,110	2,983	931	15,920	9,935	11,713	7,421	—
*Purchased	6,185	7.2	854	1,118	2,496	277	393	268	91	688	—
*Transferred	2,902	3.4	635	488	899	112	371	97	48	252	—
†TOTAL RECOVERED PAPER	23,808	27.8	1,618	2,580	6,622	609	4,330	1,886	2,039	4,124	—
Mixed Papers	2,733	3.2	204	296	763	89	505	222	230	424	—
Newspapers	4,495	5.2	262	728	1,091	109	1,004	92	191	1,018	—
Corrugated	11,416	13.3	529	847	2,773	360	2,334	1,271	999	2,303	—
Pulp Substitutes	2,857	3.3	417	438	765	31	281	244	363	318	—
High Grade Deinking	2,307	2.7	206	271	1,230	20	206	57	256	61	—
OTHER FIBERS	264	0.3	75	27	43	20	8	33	49	9	—
1992											
TOTAL FIBER	**90,138**	**100.0**	**6,048**	**5,561**	**13,764**	**1,991**	**22,114**	**12,840**	**14,544**	**13,276**	—
TOTAL WOOD PULP	63,729	70.7	4,186	2,772	6,699	1,359	17,270	10,535	12,157	8,751	—
Manufactured on-site	54,191	60.1	2,610	1,140	3,094	945	16,482	10,153	11,994	7,773	—
*Purchased	6,431	7.1	925	1,108	2,679	299	378	260	97	685	—
*Transferred	3,107	3.5	651	524	926	115	410	122	66	293	—
†TOTAL RECOVERED PAPER	26,109	29.0	1,771	2,762	7,019	612	4,836	2,272	2,322	4,515	—
Mixed Papers	2,900	3.2	218	314	805	89	537	265	249	423	—
Newspapers	5,098	5.7	296	774	1,126	110	1,147	213	269	1,163	—
Corrugated	12,436	13.8	549	915	2,979	361	2,594	1,457	1,127	2,454	—
Pulp Substitutes	3,168	3.5	468	487	817	31	331	255	424	355	—
High Grade Deinking	2,507	2.8	240	272	1,292	21	227	82	253	120	—
OTHER FIBERS	300	0.3	91	27	46	20	8	33	65	10	—
1993											
TOTAL FIBER	**91,923**	**100.0**	**6,133**	**5,455**	**14,068**	**2,003**	**22,497**	**13,236**	**14,928**	**13,555**	**48**
TOTAL WOOD PULP	63,745	69.4	4,175	2,592	6,753	1,370	17,128	10,580	12,329	8,770	48
Manufactured on-site	53,976	58.7	2,583	962	3,067	952	16,327	10,119	12,154	7,764	48
*Purchased	6,604	7.2	956	1,120	2,755	303	391	303	97	679	—
*Transferred	3,165	3.5	636	510	931	115	410	158	78	327	—
†TOTAL RECOVERED PAPER	27,860	30.3	1,867	2,835	7,268	613	5,361	2,622	2,519	4,775	—
Mixed Papers	3,064	3.3	232	331	855	90	552	280	266	458	—
Newspapers	5,526	6.0	334	789	1,187	110	1,187	282	343	1,294	—
Corrugated	13,395	14.6	551	937	3,041	361	3,053	1,697	1,218	2,537	—
Pulp Substitutes	3,249	3.5	484	496	836	31	335	275	425	367	—
High Grade Deinking	2,626	2.9	266	282	1,349	21	234	88	267	119	—
OTHER FIBERS	318	0.3	91	28	47	20	8	34	80	10	—

** Comprises all dried, wet lap or slush pulp not produced on-site including transfers from company or affiliated mills.*

† Includes construction grades and molded pulp products.

Thousands short tons

FIBER CONSUMPTION IN PAPER & PAPERBOARD MANUFACTURE (CONTINUED)

	Total U.S.	Percent of Total Fiber	New England	Mid-Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain & Pacific	Location Uncertain
1994											
TOTAL FIBER	**93,714**	**100.0**	**6,188**	**5,671**	**14,197**	**2,038**	**22,768**	**13,661**	**15,182**	**13,779**	**230**
TOTAL WOOD PULP	**64,730**	69.0	4,149	2,720	6,784	1,403	17,287	10,864	12,405	8,888	230
Manufactured on-site	**54,765**	58.4	2,549	1,150	3,077	958	16,404	10,355	12,210	7,832	230
*Purchased	**6,803**	7.3	978	1,123	2,770	310	481	328	98	715	—
*Transferred	**3,162**	3.3	622	447	937	135	402	181	97	341	—
†TOTAL RECOVERED PAPER	**28,665**	30.6	1,947	2,923	7,367	614	5,473	2,763	2,697	4,881	—
Mixed Papers	**3,133**	3.3	244	334	873	90	555	292	281	464	—
Newspapers	**5,917**	6.3	377	792	1,206	110	1,318	343	404	1,367	—
Corrugated	**13,643**	14.5	552	949	3,085	361	3,067	1,756	1,312	2,561	—
Pulp Substitutes	**3,246**	3.5	498	502	840	31	296	283	426	370	—
High Grade Deinking	**2,726**	2.9	276	346	1,363	22	237	89	274	119	—
OTHER FIBERS	**319**	0.4	92	28	46	21	8	34	80	10	—

Thousands of CORDS

PULPWOOD CONSUMPTION IN WOOD PULP MANUFACTURE

	Total U.S.	Percent of Total Fiber	New England	Mid-Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain & Pacific	Location Uncertain
1990											
TOTAL PULPWOOD	**95,831**	**100.0**	**5,261**	**2,032**	**5,516**	**1,164**	**29,678**	**18,431**	**17,357**	**16,392**	—
Roundwood & Roundwood Chips	**60,098**	62.7	4,494	1,757	4,492	1,029	20,503	13,604	11,677	2,542	—
Forest Residues	**4,417**	4.6	67	34	395	31	1,254	1,148	1,252	236	—
Manufacturing Residues	**31,316**	32.7	700	241	629	104	7,921	3,679	4,428	13,614	—
1991											
TOTAL PULPWOOD	**99,792**	**100.0**	**5,368**	**1,960**	**5,748**	**1,417**	**31,323**	**19,183**	**17,951**	**16,842**	—
Roundwood & Roundwood Chips	**62,732**	62.9	4,543	1,662	4,731	1,281	21,693	13,968	11,985	2,869	—
Forest Residues	**4,363**	4.4	70	34	331	31	1,168	1,082	1,393	254	—
Manufacturing Residues	**32,697**	32.7	755	264	686	105	8,462	4,133	4,573	13,719	—
1992											
TOTAL PULPWOOD	**103,549**	**100.0**	**5,641**	**2,034**	**5,849**	**1,443**	**32,610**	**20,151**	**18,453**	**17,368**	—
Roundwood & Roundwood Chips	**65,616**	63.4	4,581	1,717	4,827	1,308	22,805	14,750	12,509	3,119	—
Forest Residues	**4,147**	4.0	72	34	327	31	1,049	1,074	1,333	227	—
Manufacturing Residues	**33,786**	32.6	988	283	695	104	8,756	4,327	4,611	14,022	—
1993											
TOTAL PULPWOOD	**103,652**	**100.0**	**5,583**	**2,049**	**5,772**	**1,453**	**32,469**	**20,411**	**18,671**	**17,179**	**65**
Roundwood & Roundwood Chips	**65,466**	63.2	4,567	1,722	4,749	1,318	22,493	14,923	12,517	3,124	53
Forest Residues	**4,146**	4.0	72	34	327	31	1,051	1,099	1,334	197	1
Manufacturing Residues	**34,040**	32.8	944	293	696	104	8,925	4,389	4,820	13,858	11
1994											
TOTAL PULPWOOD	**104,370**	**100.0**	**5,503**	**2,073**	**5,773**	**1,460**	**32,657**	**20,669**	**18,684**	**17,206**	**345**
Roundwood & Roundwood Chips	**65,955**	63.2	4,529	1,736	4,751	1,325	22,567	15,063	12,545	3,156	283
Forest Residues	**4,224**	4.0	72	34	326	31	1,051	1,175	1,335	197	3
Manufacturing Residues	**34,191**	32.8	902	303	696	104	9,039	4,431	4,804	13,853	59

FIBER CONSUMPTION DEFINITIONS

1990 — Actual consumption
1991 — Best estimate based on year-to-date experience
1992-1994 — Consumption at capacity levels of production

ACTUAL CONSUMPTION

Thousands short tons

END PRODUCTS	1990 Total	Mixed Papers	Newspapers	Corrugated	Pulp Substitutes	High Grade Deinking
TOTAL ALL GRADES	**22,009**	**2,505**	**4,085**	**10,687**	**2,732**	**2,000**
TOTAL PAPER	**6,513**	**520**	**2,302**	**155**	**1,746**	**1,790**
NEWSPRINT	1,894	120	1,774	—	—	—
PRINTING & WRITING	1,419	18	12	14	1,010	365
PACKAGING & IND. CONV.	195	30	3	45	117	—
TISSUE	3,005	352	513	96	619	1,425
TOTAL PAPERBOARD	**14,468**	**1,565**	**1,453**	**10,300**	**942**	**208**
KRAFT,BLEACHED & UNBL.	2,608	—	17	2,432	90	69
SEMICHEMICAL	2,020	1	5	1,873	141	—
RECYCLED CONTAINERBOARD	2,664	46	38	2,547	32	1
OTHER RECYCLED PAPERBOARD	7,176	1,518	1,393	3,448	679	138
CONSTRUCTION PAPER & BOARD	**1,028**	**420**	**330**	**232**	**44**	**2**

Data on recovered paper are collected in an industrywide survey of paper and paperboard mills under the following definitions.
1990-Actual Consumption
1991-Best estimate based on year-to-date experience
1992-1994-Consumption at capacity levels of production

PLANNED FUTURE CONSUMPTION

Thousands short tons

END PRODUCTS	1991 Total	Mixed Papers	Newspapers	Corrugated	Pulp Substitutes	High Grade Deinking	1992 Total	Mixed Papers	Newspapers	Corrugated	Pulp Substitutes	High Grade Deinking
TOTAL ALL GRADES	**23,808**	**2,733**	**4,495**	**11,416**	**2,857**	**2,307**	**26,109**	**2,900**	**5,098**	**12,436**	**3,168**	**2,507**
TOTAL PAPER	**7,244**	**608**	**2,590**	**175**	**1,818**	**2,053**	**8,181**	**705**	**3,035**	**183**	**2,005**	**2,253**
NEWSPRINT	2,164	167	1,997	—	—	—	2,582	224	2,358	—	—	—
PRINTING & WRITING	1,484	23	13	14	1,036	398	1,741	43	62	14	1,143	479
PACKAGING & IND. CONV.	219	35	4	50	130	—	247	36	5	56	150	—
TISSUE	3,377	383	576	111	652	1,655	3,611	402	610	113	712	1,774
TOTAL PAPERBOARD	**15,489**	**1,690**	**1,544**	**11,007**	**996**	**252**	**16,776**	**1,744**	**1,662**	**12,002**	**1,117**	**251**
KRAFT,BLEACHED & UNBL.	2,878	27	31	2,612	105	103	3,437	11	100	3,049	176	101
SEMICHEMICAL	2,080	—	5	1,926	149	—	2,274	—	5	2,116	153	—
RECYCLED CONTAINERBOARD	3,036	51	40	2,912	32	1	3,302	57	43	3,167	34	1
OTHER RECYCLED PAPERBOARD	7,495	1,612	1,468	3,557	710	148	7,763	1,676	1,514	3,670	754	149
CONSTRUCTION PAPER & BOARD	**1,075**	**435**	**361**	**234**	**43**	**2**	**1,152**	**451**	**401**	**251**	**46**	**3**

END PRODUCTS	1993 Total	Mixed Papers	Newspapers	Corrugated	Pulp Substitutes	High Grade Deinking	1994 Total	Mixed Papers	Newspapers	Corrugated	Pulp Substitutes	High Grade Deinking
TOTAL ALL GRADES	**27,860**	**3,064**	**5,526**	**13,395**	**3,249**	**2,626**	**28,665**	**3,133**	**5,917**	**13,643**	**3,246**	**2,726**
TOTAL PAPER	**8,820**	**802**	**3,388**	**190**	**2,072**	**2,368**	**9,343**	**848**	**3,748**	**191**	**2,095**	**2,461**
NEWSPRINT	2,909	280	2,629	—	—	—	3,205	321	2,884	—	—	—
PRINTING & WRITING	1,859	54	107	14	1,168	516	1,957	54	107	14	1,182	600
PACKAGING & IND. CONV.	250	37	5	56	152	—	351	37	105	56	153	—
TISSUE	3,802	431	647	120	752	1,852	3,830	436	652	121	760	1,861
TOTAL PAPERBOARD	**17,869**	**1,805**	**1,727**	**12,953**	**1,129**	**255**	**18,149**	**1,828**	**1,756**	**13,200**	**1,103**	**262**
KRAFT,BLEACHED & UNBL.	3,648	12	112	3,261	176	87	3,733	12	117	3,371	141	92
SEMICHEMICAL	2,315	—	5	2,157	153	—	2,324	—	5	2,166	153	—
RECYCLED CONTAINERBOARD	3,951	58	43	3,815	34	1	4,050	58	43	3,914	34	1
OTHER RECYCLED PAPERBOARD	7,955	1,735	1,567	3,720	766	167	8,042	1,758	1,591	3,749	775	169
CONSTRUCTION PAPER & BOARD	**1,171**	**457**	**411**	**252**	**48**	**3**	**1,173**	**457**	**413**	**252**	**48**	**3**

PROJECTS INCLUDED IN SURVEY ESTIMATES

Expansion projects include new paper, paperboard, and wood pulp mills and new paper and paperboard machines in existing mills. These projects have been publicly announced by the managements of the companies concerned and are included in the capacity estimates reported in this survey. Survey estimates also include confirmed expansion projects that have not been publicly announced which, in keeping with the confidential nature of the survey, are not included in this listing.

Thousands short tons

GRADES	ANNUAL CAPACITY	PROPOSED START-UP	COMPANY & LOCATION
Newsprint	245†	1990	Alabama River Newsprint Company, Claiborne, AL
Newsprint	245	1991	North Pacific Paper Company, Longview, WA
Coated Free Sheet	265	1990	Champion International Corporation, Quinnesec, MI
Coated Free Sheet	212	1992	Consolidated Papers Inc., Wisconsin Rapids, WI
Coated Free Sheet	225	1990/1991	Scott Paper Company, Skowhegan, ME
Uncoated Free Sheet	300	1991	Boise Cascade Corporation, International Falls, MN
Uncoated Free Sheet	240	1994	Champion International Corporation, Courtland, AL
Uncoated Free Sheet	325	1991	Georgia Pacific Corporation, Ashdown, AR
Uncoated Free Sheet	240	1991	Union Camp Corporation, Eastover, SC
Uncoated Free Sheet	300†	1990	Willamette Industries Inc., Bennettsville, SC
Tissue	80	1990	Chesapeake Corporation (Wisconsin Tissue Division), Menasha, WI
Tissue	65	1991	Fort Howard Paper Company, Rincon, GA
Tissue	65	1993	Fort Howard Paper Company, Green Bay, WI
Tissue	68†	1990	Kimberly-Clark Corporation, Jenks, OK
Tissue	n.a.†	1990	Kimberly-Clark Corporation, Loudon, TN
Tissue	n.a.	1990	Kimberly-Clark Corporation, Loudon, TN
Tissue	n.a.	1992	Kimberly-Clark Corporation, Loudon, TN
Tissue	30	1992	Mosinee Paper Corporation (Bay West Paper Division), Middletown, OH
Tissue	45 net*	1992	Potlatch Corporation, Lewiston, ID
Tissue	70	1993	Procter & Gamble Company, Oxnard, CA
Specialty Packaging Papers	59	1990/1991	Consolidated Papers Inc., Stevens Point, WI
Unbleached Kraft Linerboard	350	1990	Gaylord Container Corporation, Bogalusa, LA
Unbleached Kraft Packaging Paper	100	1990	Longview Fibre Company, Longview, WA
Unbleached Kraft Paperboard	375	1990	Mead Corporation, Mahrt, AL
Unbleached Kraft Linerboard	150 net*	1991	Union Camp Corporation, Savannah, GA
Solid Bleached Paperboard	220††	1993	Westvaco Corporation, Covington, VA
Recycled Containerboard	210†	1993	Temple-Inland Inc., Maysville, KY
Recycled Paperboard	35	1990	U.S. Paper Mills Corporation, Menasha, WI
Bleached Sulfate Market Pulp	480	1992	Alabama Pine Pulp Company, Claiborne, AL
Bleached Sulfate Market Pulp	260	1991	Stone Container Corporation, Port Wentworth, GA
Bleached Sulfate Market Pulp	400	1990	Weyerhaeuser Company, Columbus, MS
Bleached Sulfate Market Pulp	180	1991	Union Camp Corporation,Eastover, SC

n.a. - not available **Will replace existing capacity* *†New Mill ††Eventual capacity 350*

•PRACTICAL MAXIMUM CAPACITY

Practical Maximum Capacity, as defined in this survey, is the tonnage of paper, paperboard or pulp of normal commercial quality that could be produced with full use of equipment and adequate supplies of raw materials and labor, and assuming full demand. No allowance is made for losses due to unscheduled shutdowns, strikes, temporary lack of power, etc., which cause decreases in actual production but not in productive capacity. Capacity of paper machines which produce more than one grade is apportioned in accordance with actual production patterns or plans for future operation

Capacity is reported in short tons of net finished paper and paperboard and air-dry (10% moisture content) pulp. Shrinkage of bleached or semibleached pulp is taken into account.

Annual practical maximum capacity— includes changes in capacity only for the portion of the year in which they are actually effective

Year-end practical maximum capacity— assumes that all changes in capacity are in effect from the first day of the year in which they occur.

NEW MACHINES AND NET IMPROVEMENTS: Capacity increases or decreases are shown in two main groups: New Machines and Net Improvements.

New Machines — are defined as machines purchased or to be purchased from equipment manufacturers. Consequently, capacity changes resulting from transfers of paper machines from one mill to another are shown under Net Improvements.

Net Improvements — are defined as net changes resulting from modernization of machines, dismantling old machines, shifts in grades, etc.

Capacity increases from new machines are shown under New Machines for the first two years of operation (including the year of installation). Any additional capacity realized in a third or subsequent year is shown under Net Improvements.

MARKET PULP CAPACITY: Market pulp in this survey is defined as wood pulp produced in the U.S. for sale to pulp consumers. It excludes pulp for use or consumption by a producing mill or for shipment by a producing mill to other mills within its supply region which it owns, controls or with which it is affiliated. Shipments to owned mills outside the U.S. are defined as market pulp.

•PAPER GRADES

NEWSPRINT: Paper used chiefly in the printing of newspapers, made largely from mechanical pulp and weighing not less than 28 pounds nor more than 35 pounds (24 x 36 - 500).

UNCOATED GROUNDWOOD: Uncoated papers containing more than 10% groundwood or other mechanical pulps in their furnish, excluding newsprint.

MACHINE AND OFF MACHINE COATED: Bleached papers with a coating weight of at least 2 pounds (25 x 38 - 500) on either side and at least 50% of the coating consisting of clay (Kaolin).

Coated Groundwood: Coated papers containing more than 10% mechanical pulp (mostly stone groundwood and/or refiner) in their furnish.

Coated Free Sheet: Coated papers containing 10% or less mechanical pulp (mostly stone groundwood and/or refiner in their furnish).

UNCOATED FREE SHEET: Bleached uncoated printing and writing papers containing not more than 10% groundwood or other mechanical pulps in their furnish; i.e., offset, tablet, envelope, business papers (bond, ledger, mimeo, duplicator) form bond, cover and text and related papers.

BLEACHED BRISTOLS: Includes tabulating index, tag and file folder, coated cover bristols, and uncoated bristols (index, printing, and postcard).

COTTON FIBER: Papers containing 25% or more in their furnish of cotton, cotton rags, cotton waste, linters, linter pulp, flax, or similar fibers.

THIN PAPERS: Includes carbonizing, condenser, cigarette, bible, and similar papers.

PACKAGING AND INDUSTRIAL CONVERTING: Wrapping paper, shipping sack, bag and sack other than shipping sack, and other converting papers – 18 pounds and over.

Unbleached Kraft: Paper containing more than 80% unbleached sulfate wood pulp. Wrapping paper, shipping sack, grocers sack and other bag, and other converting papers – 18 lbs. and over (24 x 36 - 500).

Bleached Packaging and Industrial Converting: Paper made for similar end uses as unbleached kraft, but made from bleached, and semibleached sulfate and unbleached sulfite pulps. Wrapping paper, shipping sack, grocers and other bag and sack, and other converting papers – 18 lbs. and over (24 x 36 - 500).

Specialty Packaging: Paper and board of all weights and furnishes, usually used as protective packaging for food and other consumer products, such as bakery bags, fast food and frozen food wraps. Also includes glassine, greaseproof and vegetable parchment paper.

Special Industrial: Paper and board, of all weights, calipers and furnishes, designed for specialized end uses and manufactured to exact customer specifications; includes abrasive paper, electrical insulation, filter paper and similar grades. Does not include wet machine board.

TISSUE: Includes sanitary grades: i.e., toilet, facial, napkin, toweling, sanitary napkin, wiper and special sanitary papers, and waxing, wrapping, wadding and miscellaneous grades.

• PAPERBOARD GRADES

UNBLEACHED KRAFT PAPERBOARD: Paperboard made from a furnish containing not less than 80% wood pulp produced by the kraft sulfate process.

Linerboard: Unbleached kraft paperboard manufactured for use as facing material when combining paperboard for conversion into corrugated or solid fiber boxes. Includes solid unbleached kraft linerboard, both Fourdrinier and Cylinder, mottled white linerboard and clay coated unbleached kraft linerboard.

Folding: Paperboard manufactured, such as clay coated unbleached kraft and bleached lined unbleached kraft backed, for conversion into folding cartons and beverage carriers.

Other: All unbleached kraft paperboard whose end use is not otherwise classified, such as board for a filler for solid fiber board to be fabricated into a shipping container, tube, can, drum, file folder, tag, automotive panel, etc.

SOLID BLEACHED PACKAGING PAPERBOARD: Paperboard made for use in packaging from a furnish containing not less than 80% virgin bleached wood pulp. Bleached bristols not manufactured for packaging are included in the proper bleached bristol classification under papers

Linerboard: Solid bleached paperboard, either Fourdrinier or Cylinder, manufactured for use as facing material when combining paperboard for conversion into corrugated or solid fiber boxes.

Folding: Solid bleached paperboard for conversion into folding cartons, such as folding cartons for ice cream, butter, oleomargarine, frozen foods, bakery products, cosmetics, drugs, etc.

Milk Carton and Food Service: Solid bleached paperboard for conversion into milk carton, heavyweight cup, and round nested food container, plate, dish and tray, and for packaging for moist, liquid and oily foods.

Other: Solid bleached paperboard for conversion into packaging of blister pack, tubes and other products not classified above and for industrial products not classified under bleached bristols.

SEMICHEMICAL PAPERBOARD: Paperboard made from a furnish containing not less than 75% virgin wood pulp, the predominant portion of which is produced by a semichemical process.

RECYCLED PAPERBOARD: Paperboard manufactured from a combination of recycled fibers from various grades of paper stock with the predominant portion of its furnish being recycled fibers: sometimes including a very minor portion of virgin fibers.

Linerboard: Recycled paperboard produced from a furnish containing less than 80% virgin kraft wood pulp and used as facing material when combining paperboard for conversion into corrugated or solid fiber boxes.

Corrugating Medium: Recycled paperboard produced from a furnish containing less than 75% virgin wood pulp and used as the fluting material when combining paperboard for conversion into corrugated boxes.

Container Chip and Filler Board: Recycled paperboard manufactured as a filler for solid fiber board for conversion into solid fiber boxes and other container chipboard (all chipboard under 26 pounds per 1000 sq. ft. manufactured for use as facing corrugated, solid fiber and single faced products which are used for interior packaging, e.g., pads, partitions, dividers, layers and cushioning).

Folding: Recycled paperboard manufactured with bending quality for conversion into folding cartons (including unlined chipboard, kraft lined, white lined and clay coated).

Set-up: Recycled paperboard manufactured with non-bending specifications for conversion into rigid or set-up boxes (including plain chipboard, newslined, white vat lined).

Gypsum Wallboard Facing: Recycled paperboard manufactured for use as liner or facing on gypsum board and plasterboard (includes white, cream, gray, blue and all colors).

Other: Recycled paperboard with the same characteristics as paperboard for bending packaging or non-bending packaging but not for non-packaging uses; plus recycled paperboard for end uses not otherwise classified, such as tag, file folder, tube, can, drum, match stem, tablet backs, toys, etc.

•CONSTRUCTION PAPER & BOARD

CONSTRUCTION PAPER: Sheathing paper, felts (roofing felts, floor covering, automotive felts, deadening, industrial, pipe covering, refrigerator), asbestos paper and asbestos filler paper, flexible wood fiber insulation.

WET MACHINE BOARD: Binders board, shoe board (e.g., counter board, heel board, innersole, etc.) automotive board, chair seat backing, coaster board, luggage, mill board, panel board, table top board, etc.

INSULATING BOARD: A fibrous-felted homogenous panel made by interfelting of the fibers (e.g., interior building board, wallboard, sound deadening board, acoustical tile, exterior sheathing board, roof insulation board, trailer board, etc.).

•WOOD PULP

DISSOLVING & SPECIAL ALPHA: Highly refined bleached white sulfite or sulfate pulp with a high content of alpha (pure cellulose) fiber.

SULFITE PAPER GRADES: Paper grade pulps produced by the sulfite process. Bleached pulp must achieve a G.E. Brightness of more than 75.

SULFATE PAPER GRADES: Paper grade pulps produced by the sulfate or soda process. Bleached pulp must achieve a G.E. Brightness of more than 75. Semibleached pulp must achieve a G.E. Brightness of not less than 45 or more than 75.

SEMICHEMICAL: High yield pulps produced with the use of some chemical agent such as neutral sulfite (N.S.S.C.), alkaline cook, chemipulp (defibrated pulp put through reaction chambers), chemimechanical pulp with a yield usually above 60%.

MECHANICAL: Fine textured, usually bright pulps, used in paper and paperboard manufacture and produced by mechanical rather than chemical processes.

Stone Groundwood: Pulp produced by grinding wood logs or bolts (usually 4 ft. in length) into relatively short fibers.

Refiner: Pulp produced by subjecting wood chips and/or residues to atmospheric or open discharge refining.

Thermomechanical: A high-yield pulp produced by a thermomechanical process in which wood particles are softened by preheating under pressure prior to a pressurized primary refining stage. Usually replaces or reduces the chemical pulp component in newsprint or groundwood papers.

•WOOD PULP FOR CONSTRUCTION PAPER & BOARD

Coarse, often brown, pulps used in the manufacture of insulating board and construction paper. Also includes similar pulps if used in the manufacture of wet machine board. Excludes pulp for hard pressed board.

Stone Groundwood and Refiner: Pulps produced by the stone groundwood or refiner processes but used in the manufacture of construction paper and board.

Defibrated/Exploded: Pulps produced by subjecting wood chips to preheating and pressurized refining. Similar to the thermomechanical process except that operating variables produce an economical, coarse brown pulp suitable only for construction paper and board.

Screening: Rejects and off-quality screenings from all grades of wood pulp except dissolving.

•FIBERS

Roundwood: Comprises roundwood bolts and logs (4 feet or longer, including tree lengths) brought to the pulpmill for chipping, or chips made from primary roundwood bolts and logs at a chipmill, remote from the pulpmill

Forest Residues: All logging residues such as portions of bolts or logs less than the minimum diameter specified by the consuming mill and poles, saplings, slash, limbs, twigs, or portions of bolts or logs not regarded as merchantable in normal pulpwood or sawlog operations. May also include merchantable portions of trees that will not be used for higher value products. Chips made from forest residues.

Manufacturing Residues: All mill residues such as slabs, edgings, trimmings, cores, planer shavings, sawdust or other wood residues of a wood manufacturing process and chips made from these residues.

Other Fibers: Cotton linters, cotton linter pulp, textile mill waste and cuttings, rags, waste rope and cordage, bagasse, flax, straw, jute, esparto, kenaf and all other vegetable fibers used in paper and paperboard manufacture.

•RECOVERED PAPER

Definitions are abstracted from the Institute of Scrap Recycling Industries' (ISRI) Scrap Specifications Circular 1990. The 51 grades and 33 specialty grades in this circular have been condensed into the five groupings listed below.

Mixed Papers: Mixed papers, super mixed papers, boxboard cuttings, mill wrappers, specialty grades and all other grades not elsewhere specified. ISRI grades 1-5 and 1S-22S, and 24S-33S.

Newspapers: Old newspapers, special news (including deink quality) over-issue news, white blank news, groundwood computer printout, publication blanks, mixed groundwood and flyleaf shavings, coated groundwood sections. ISRI grades 6-9, 22-27, 44 and 23S.

Corrugated: Old containers both corrugated and solid fiber, container plant cuttings, kraft paper and bags. ISRI grades 10-21.

Pulp Substitutes and High Grade Deinking: Includes ledger, tabulating cards, bleached sulfate shavings (unless used as a news substitute). Envelope and bleached sulfite and sulfate cuttings, coated book stock and computer printout. Print free grades are reported as Pulp Substitutes and printed grades, if deinked, are reported as High Grade Deinking. ISRI grades 28-43, 45-51.

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